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FEB 18 1963

*"...in all the land"*



**THE HUNTING SURVEY COMPANIES**



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# Company History

Hunting Survey Corporation Limited is a private company incorporated under the laws of Canada, "To conduct . . . aerial and ground surveys, explorations and studies . . . for the discovery, exploration and exploitation of natural resources . . ."

The Canadian Company is one of the world-wide Hunting Group of survey companies and was formed in 1946 as "The Photographic Survey Corporation Limited". The Group in Canada expanded over the years and now comprises ten companies with headquarters in Toronto.

Hunting Survey Corporation Limited was formed in 1960 to integrate the services of three former companies in the Group, namely, The Photographic Survey Corporation Limited (1946), Hunting Airborne Geophysics Limited (1949) and Hunting Technical and Exploration Services Limited (1954).

During fifteen years of experience, assignments have taken the personnel of H.S.C. to over 50 countries around the world. Total staff exceeds 350, of which one fifth are professional scientists and engineers, including geologists, geophysicists, foresters, agriculturalists, physicists and civil engineers.

Associations have been formed with companies in the U.S.A., Argentina, Brazil, Chile, Peru, Venezuela, Pakistan and Australia.

H.S.C. is equipped with the latest photogrammetric, survey and geophysical instruments, and operates some 20 aircraft.

Services include:

**AIR OPERATIONS** — Aerial photography, airborne geophysics, control surveys with Airborne Profile Recorder (APR) and electronic distance measurement, helicopter services, air transport.

**SURVEY OPERATIONS** — Geodetic surveys, control surveys, photogrammetric maps and mosaics, topographic surveys, cadastral surveys, tax mapping, engineering surveys, route location, earth quantities, micro-wave path proving, pipe line surveys.

**GEOPHYSICAL SURVEYS** — All types of airborne and ground geophysical surveys and interpretation including — airborne and ground magnetics, airborne and ground electromagnetics, gravity, shallow seismics, water-borne seismics, induced polarization, resistivity, Afmag, Turam, Ronka.

**RESOURCES SURVEYS** — Geological services, forestry, soil surveys, land use and land capability surveys, hydrology.

*There is no substitute for experience . . .*





Kenting Aviation photo/APR equipped Fortress at Frobisher, Baffin Island.

## The Canadian Arctic



*The wealth of a nation is closely related to the wealth of its proven natural resources . . .*

Interest has been focussed in the last decade on developing the large land masses in the Canadian Arctic. These were to a great extent unmapped and the information on them inadequate.

In 1958 HSC was awarded a contract by the Canadian Department of Mines and Technical Surveys to photograph 220,000 square miles (570,000 square kilometers) stretching from Frobisher on Baffin Island to the most northerly tip of the American Continent on Ellesmere Island. This was successfully completed in three years

using two B17 Flying Fortress aircraft with logistic aircraft support.

The operation called not only for the provision of air photography, using the latest precision cartographic cameras, but also for the obtaining of a simultaneous Airborne Profile Recorder (APR) record, to provide vertical control for subsequent mapping.

The operation was most difficult, due to the short 2 month flying season and the great distances between bases. Most supplies had to be flown in, although barrels of fuel were sent in by





Kenting S-55 helicopter during winter operation on Arctic DEW line supply operation.



Mr. A. F. Soutar, General Manager—Flying Operations (2nd from left) checking details of aerial photo operation with Fortress crew at Frobisher.



"On-the-spot" photo check by Kenting crew member

sea in each previous year. To maintain communications HSC established two-way radio contact on a 24 hour schedule between Toronto and all the bases, thus enabling weather data to be relayed, spares to be expedited and information to be exchanged on the results of the processed photography.

To provide horizontal control for mapping HSC established 8 Shoran stations in the area and then flew a Shoran-controlled photographic grid. Shoran stations were flown in while the ice was still on the lakes and dog teams were used to haul the equipment to the high ground.

In other parts of the Arctic the horizontal control is being provided by triangulation using helicopter-borne Tellurometers. The survey staff in this case is provided by the Canadian Government, but the Sikorsky S55 helicopters, carrying the instruments are owned and operated by Kenting Helicopters Limited. The latter is one of the companies of the Canadian Hunting Group, and the first organization to operate helicopters year round in the Arctic.



# 2



One of the 33 field camps established by three forest survey crews during Ceylon island-wide forest inventory.

## Ceylon and Pakistan Resources Surveys

*In a country like this, not even the least quantity of rainwater should be allowed to flow into the ocean without profiting man.*

*Let there not be left anywhere in all the land a piece of ground, though it be of the smallest dimensions, that does not yield some benefit to man.*

King Parakrama Bahu I (1153-1197)

The founding of Pakistan in 1947 created sudden and enormous problems with the influx of millions of immigrants and the consequent needs of resettlement and employment. Similarly in newly independent Ceylon the growth of population was far outstripping the increase in agricultural production, and industrial development was hampered by a lack of proven mineral resources and a shortage of power. Both these countries, therefore, faced a similar urgent need for detailed knowledge of their natural resources, including soils, water, forests and minerals — a task normally requiring generations.

In 1952 the Canadian Government, under its External Aid Program (Canadian Colombo

Plan), agreed to support a resources survey of West Pakistan to cost over \$3,000,000, and subsequently, in 1955, a similar operation was started for Ceylon. Both these assignments were awarded to Hunting Survey Corporation.

The Pakistan survey called for geological mapping of 160,000 square miles (420,000 sq. kms.) and for a land use and soil survey of 110,000 square miles (290,000 sq. kms.). The first step was obtaining aerial photography of the whole of West Pakistan, some 298,000 square miles (765,000 sq. kms.). This was followed by four years of photographic interpretation and field work. Finally there was a two year period of compilation and map printing.

The field work was carried out by mobile parties of Canadian and Pakistani engineers, moving by jeep, helicopter or camel, according to terrain. The results of the surveys are contained in comprehensive reports. 29 geological sheets in full colour present the classification of rocks in over 90 categories. 50 map sheets, also in colour, define land forms and soils and present land use.





Hunting and Ceylonese personnel in the drawing office of the Natural Resources Survey Centre established under the Colombo Plan Survey.



A Hunting designed and engineered Ronka horizontal loop ground electromagnetometer used for locating sulphide bodies.



Portable auger used for testing soils samples.

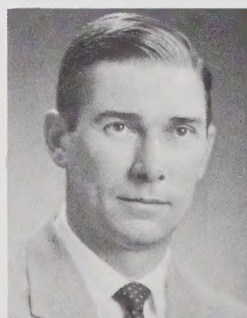
In Ceylon the first step was aerial photography of the whole country. Then began reconnaissance surveys of land and water resources for future planned development by major river basins. These studies included geology, land forms, soils and land use, forest cover, hydrology, a plan for irrigation and power development and a study of the problems and potentialities for economic development. Where required for engineering study, topographic maps were compiled.

In case of the forestry, detailed studies for management plan purposes were carried out of special areas such as proposed forest reserves. On the geological side field work was undertaken not only for mapping purposes, but also for engineering geology at dam sites. In support of the geology airborne and ground geophysical surveys assisted in evaluating economic possibilities.

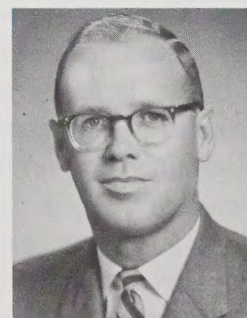
A main feature of both the Pakistan and Ceylon operations was the integration achieved with the staffs of the Government Departments concerned. They participated in a major way in every phase of the project, thus ensuring, first the interchange of experience, second continuity of the survey effort in the country concerned, and third economic implementation of projects emerging from the surveys.

All data collected, including field notes and samples, final reports and maps, have been turned over to the respective governments. In Pakistan reclamation work is proceeding on millions of acres of land, and discoveries of natural gas provide power needed for economic growth.

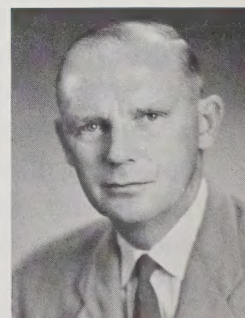
In Ceylon a great land and water development program is emerging on a sound financial, social and scientific basis. Food and power production are increasing at a remarkable rate.



J. M. Henderson, B.Sc.  
Vice President Hunting  
Associates (International)  
Ltd.



R. N. Parkinson, M.A.Sc.  
(Mining Geology)  
Manager, Special projects



V. G. Merritt, B.Sc.F.  
Chief, Forestry operati





Ground survey party working along the banks of the Mekong River. Umbrellas were used to shade the instruments from the heat of the sun.

# 3

## The Mekong River Survey

*"Wise conservation and utilization of its waters will contribute more toward improving human welfare in the area than any other single undertaking."*

The Wheeler Report, World Bank Mission

The Mekong is one of the few remaining undeveloped great rivers of the world. Its harnessing, which can produce 4 million h.p. and treble rice production is, perhaps, the major planning project in S. E. Asia, affecting Cambodia, Laos, Thailand and South Viet Nam.

Development of the river has long been held up by the non-existence of the necessary basic engineering data. Accordingly, in 1959, a number of nations through ECAFE undertook to support the various phases of this work. The U.S. Government, for instance, accepted responsibility

for the hydrology, and Canada took on the engineering survey.

The size and timing of the task indicated the advisability of conducting the survey on a Canadian industry-wide basis. Accordingly, Hunting Survey Corporation were appointed as management engineers and six other companies took prominent roles.

The task included establishing a triangulation network, plus levels, of the river from its mouth to the Burma border (1,600 miles — 2,500 kms.). Aerial photography was to be obtained

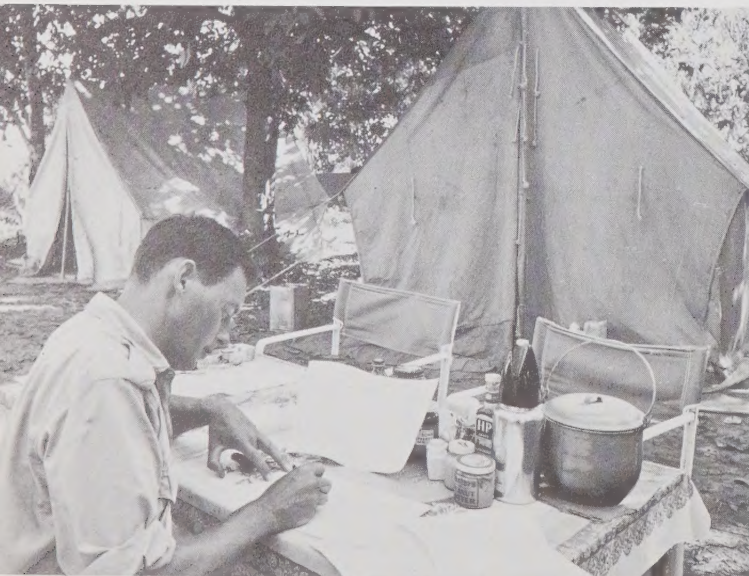




The Canadian teams of surveyors worked in the field with the help of local and Filipino labour.



A Canadian amphibious Beaver was used as liaison and supply aircraft between base and field camps.

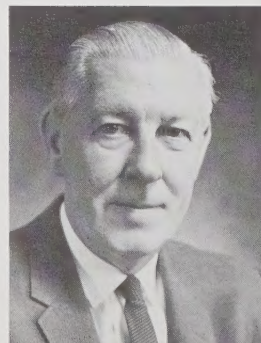


Canadian surveyor compiling data at a field camp on the Mekong River. Some 5800 line miles of ground survey were completed to produce the required data along 1600 miles of river.

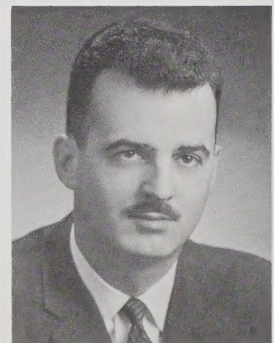
and topographic maps compiled of the entire main stream and many principal tributaries, and additionally, at larger scales, of possible dam site areas.

The whole of the field survey work was carried out on schedule during one six month dry season — 1959/60. To complete it, seventeen aluminum boats with outboard motors were shipped from Canada, together with an amphibious Beaver aircraft and all necessary supplies and equipment. The staff consisted of 26 Canadian engineers, 66 Filipino surveyors and 172 local personnel, for a total of 264 men.

To provide map control for certain tributary areas, profiles were obtained with the Airborne Profile Recorder. This mapping, together with that of the main stream and the dam sites is now well in hand in Canada, and will be completed by mid 1962.



J. G. Wilkinson,  
Technical Director



R. A. Brocklebank,  
B.A.Sc. Civil Engineer  
Chief Engineer, surveys  
and mapping





AFMAG used in survey in Arizona for detecting sulphide bodies by utilizing natural audio frequency magnetic fields.

## Integrated Minerals Exploration



*"The total picture is much greater than the area of its parts."*

Hunting Survey Corporation and its associates in the U.S.A. and Latin America, provide exploration services. HSC supports the philosophy that the probabilities of success in exploration increase measurably if all applicable methods are used on an integrated basis. Thus, not only do they provide information of themselves, but additional information by cross-checking with each other.

To provide these services HSC has a large permanent staff of experienced geologists and

geophysicists, and has undertaken programmes in over 30 different countries. HSC operates the largest range of geophysical tools available anywhere, with over 15 different types of instruments to fit varying conditions. Eight well known geophysicists head a team of over 100 technicians engaged in field operations and data reduction.

A recent project in a mountain desert for a mining company gives a range of the services which can be provided. The steps involved are outlined on the following page.

- STEP I Simultaneous flying of colour and black and white aerial photography of the area.
- STEP II Geologic interpretation of the aerial photography.
- STEP III Field checking and editing of the photo-geologic interpretation.
- STEP IV Combined airborne magnetometer and scintillometer geophysical survey of the area.
- STEP V Geological interpretation of the airborne geophysical data.
- STEP VI Geochemical survey comprising the collection and analysis of selected alluvium, rock chip and water samples.
- STEP VII Reconnaissance geologic mapping in areas selected from the history of the area, photo-interpretation, airborne geophysical data and the geochemical data.

- STEP VIII Reconnaissance ground geophysical surveys, including the use of ground magnetometer and Afmag equipment in areas selected from the results of steps 1 to VII.
- STEP IX Detailed geologic mapping at a scale of 1:5,000 in areas selected from results of steps 1 to VIII.
- STEP X Detailed ground geophysical surveys including Induced Polarization in areas selected from the results of steps 1 to IX.
- STEP XI Diamond drilling on specific targets selected from the previous steps.

By tackling the problem in this sequence, the maximum information was obtained in the minimum time at an acceptable cost. The combination of photogeology, airborne geophysics, geochemistry, geologic mapping and ground geophysics narrowed the search and the subsequent drilling to the area of maximum commercial potential.



Potential station of Induced Polarization unit used to detect disseminated sulphides.



A. G. Jones, Ph.D.  
Chief Geologist



R. H. Stebbins, M.A.  
Chief Geologist and  
General Manager of  
Hunting Geophysical  
Services Inc.



# The Mattagami Mines Story

5

*The credit of actually locating the Mattagami ore body must be given to Hunting Survey Corporation, and can be added to their string of successes.*

K. J. Springer, C.I.M.M. Bulletin

In April 1957 Hunting Survey Corporation was commissioned by the Mattagami Syndicate to carry out an airborne geophysical survey of a six hundred square mile area of Northwestern Quebec. Although prospected since 1928 no important mineral discoveries had been made in the district owing to an extensive cover of deep glacial overburden.

The survey was carried out using a Canso aircraft fitted with a Gulf airborne magnetometer and with the Hunting electromagnetic system measuring phase shift at two frequencies, 400 c.p.s. and 2300 c.p.s. Flight line spacing was 1320 feet and flying height 500 feet. The flying was completed in five days.

A strong magnetic anomaly with a coincident electromagnetic anomaly was selected as the first priority target for ground checking and diamond drilling. One year and six days after the airborne survey was completed the diamond drill started, and after passing through 50 feet of clay drove into massive sulphides of Zinc, Copper and Silver.

Subsequent intensive exploration has revealed four additional ore bodies in the immediate vicinity of the discovery. These are smaller but nevertheless represent important additions. Total tonnage is now 30,000,000 grading 12% zinc, .75% copper, .02 oz. gold, and 1.25 oz. silver.

A little further afield three more promising discoveries have been made. It is apparent therefore that what has been found is a whole new mining area. Already road and rail connections are being made and a zinc smelter being planned. Before very long 10,000 people will owe their livelihood to the enterprise of the Mattagami Syndicate and the unique skills of Hunting Survey Corporation.



The new Hunting helicopter-borne electromagnetometer which includes the Gulf MK 111 magnetometer in the mid section of the bird.



Close-up of the fixed wing EM bird in the cradled position.



N. R. Paterson, Ph.D.  
Chief Geophysicist

## Resources Development Chile and Peru

*. . . It means the dedication of a greatly increased proportion of national resources and capital to the cause of development . . . changes such as land reform and tax reform. . . . This heroic effort is not for Governments alone. Its success demands the participation of all our people.*

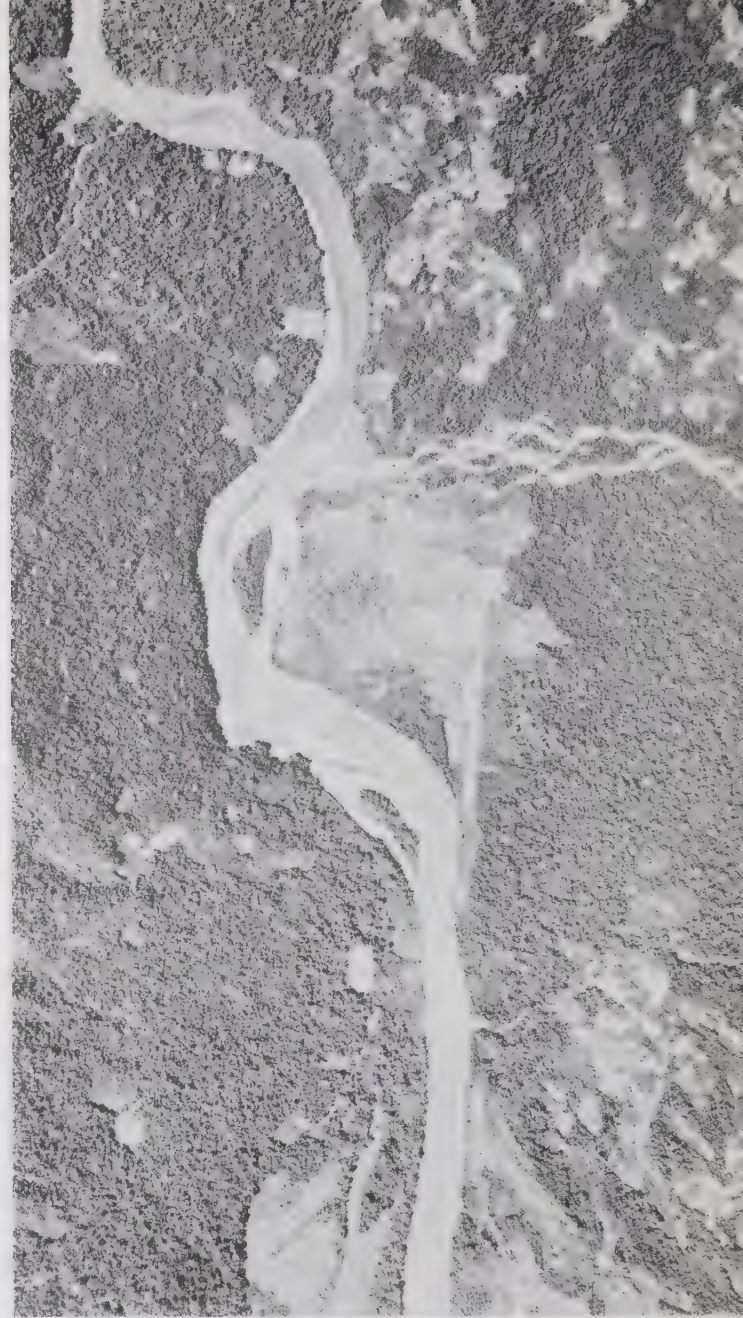
John F. Kennedy, President of The United States  
Message to Inter-American Conference

Throughout Latin America the emphasis today is on agrarian reform and industrialization. HSC is playing its part in various stages of these plans in most countries in Latin America. Typical is the work in Chile and Peru.

A main planning objective of the Peruvian Government is the development of a region called "PeruVia". This covers 100,000 square kilometers lying on the east slopes of the Andes. The ground height in the area varies from 1,500 feet (450m) to 15,000 feet (4,500m), giving a considerable range of soil and climatic conditions.

Within the area lies the Mantaro River, with a large power potential. This is to be harnessed.

HSC is engaged on the task of providing topographic maps from APR controlled photography for engineering studies of the power development. HSC is also working with Peruvian Government organizations in the securing of aerial photography of the area, the provision of control, topographic mapping, selection of access routes, geological, forestry and soils mapping and hydrology. The final application of HSC's



A settlement east of the Andes in Peru.



work will be economic studies to find the best means of settling the area and developing its industrial/agricultural mining potential using Mantaro power.

Preliminary analysis of the radar profiles has already provided new information regarding the Mantaro river course, revealing a probable power potential double that which has been long assumed.

HSC's work in Chile was sparked by the earthquake disaster. Following it, the Chilean Government was faced with a major task of rehabilitation in the affected area, and decided that the correct approach was to base the recovery program on the natural resources available (soils, minerals, power, forest and water).

The task was so huge and urgent that the Chilean Government sought the help of The Organization of American States (O.A.S.), who in turn brought in a consortium of four leading companies, internationally known in the various fields involved. HSC was one of the four companies selected.

HSC's work has included the obtaining of part of the air photography, airborne geophysics, photo interpretation and the provision of ten engineers in the fields of geology, land use, soils, agronomy and forestry. The whole project exceeds \$3 million, and is the largest operation of its kind currently taking place in Latin America. A major feature of the project is mapping of the agricultural areas for tax revision purposes and for planning agrarian reform.



Agricultural lands in the central valley of Chile.



D. A. MacFadyen,  
Vice President, Hunting  
Associates (International)  
Ltd.



R. C. Hodges, B.Sc.  
Chief, Land Use and  
Soils Division





# 7

## Application of The Airborne Profile Recorder

*"The radar profile offers an immediate solution to a great many of the technical problems connected with topography."*

T. J. Blachut, National Research Council of Canada

A typical APR controlled photogrammetric operation has recently been carried out in the foothills east of the Andes in Peru. A mining concession, in extremely rugged forested terrain, was to be mapped at 1:5000 scale with 50 metre

contours. No ground control could be provided in the area. Approximately 10 kms. from the edge of the concession a section of the nearest road could be used to establish a single distance and direction, and a reference bench mark was available.

APR flight lines with simultaneous survey photography were laid out to cover this nearest ground control, and to extend in a block some 40 kilometers out over the area to be map-



ped. In subsequent aerial triangulation of the photography, both map scale and elevation values were controlled by the APR data. It was possible to map the isolated block of 250 sq. kms. with a horizontal accuracy better than one part in 1,000 and a vertical accuracy better than plus or minus 5 metres.

When the Hunting Airborne Profile Recorder was put into general operation ten years ago, it was used largely to provide elevations for aeronautical charts. As the instrument was improved, it became practical to use the profiles as a source of elevation control for photogrammetric mapping. More recently, by synchronizing with air survey photography, the APR has provided elements for control of photogrammetric map scale, as well. In effect, ground survey has been entirely substituted for certain conditions.

In operation, the APR provides two records, the first of which is the terrain clearance. For this, the distance between an aircraft and the surface of the earth along its flight path, is measured by a narrow radar beam directed downwards from the aircraft, the clearance being recorded continuously on a moving chart. The height of the synchronized survey camera above the ground, and hence the exact scale of the photography, becomes known.

The second record is the terrain profile, within which the vertical movements of the aircraft have been corrected continuously and automatically by a precision electronic hypsometer. This profile is located on the ground by a synchronized 35 mm positioning camera. For use of the terrain profile, corrections are made for inclination of the pressure altitude plane to which the hypsometer relates, and correlation may be made with known ground values such as sea level, which have been crossed during flight.

HSC aircraft have produced APR profiles equivalent in length to seven times around the world. The method lends itself to a wide variety of uses, dependent on circumstances. Control may be produced for existing photography for example, or during new photography. Very large savings in both time and cost are made possible by the reduction or elimination of ground survey for mapping with contour intervals as close as 5 metres.



The vertical radar antenna and parabolic reflector of the APR being mounted in a Lockheed aircraft.



The APR Mk 5 installation.

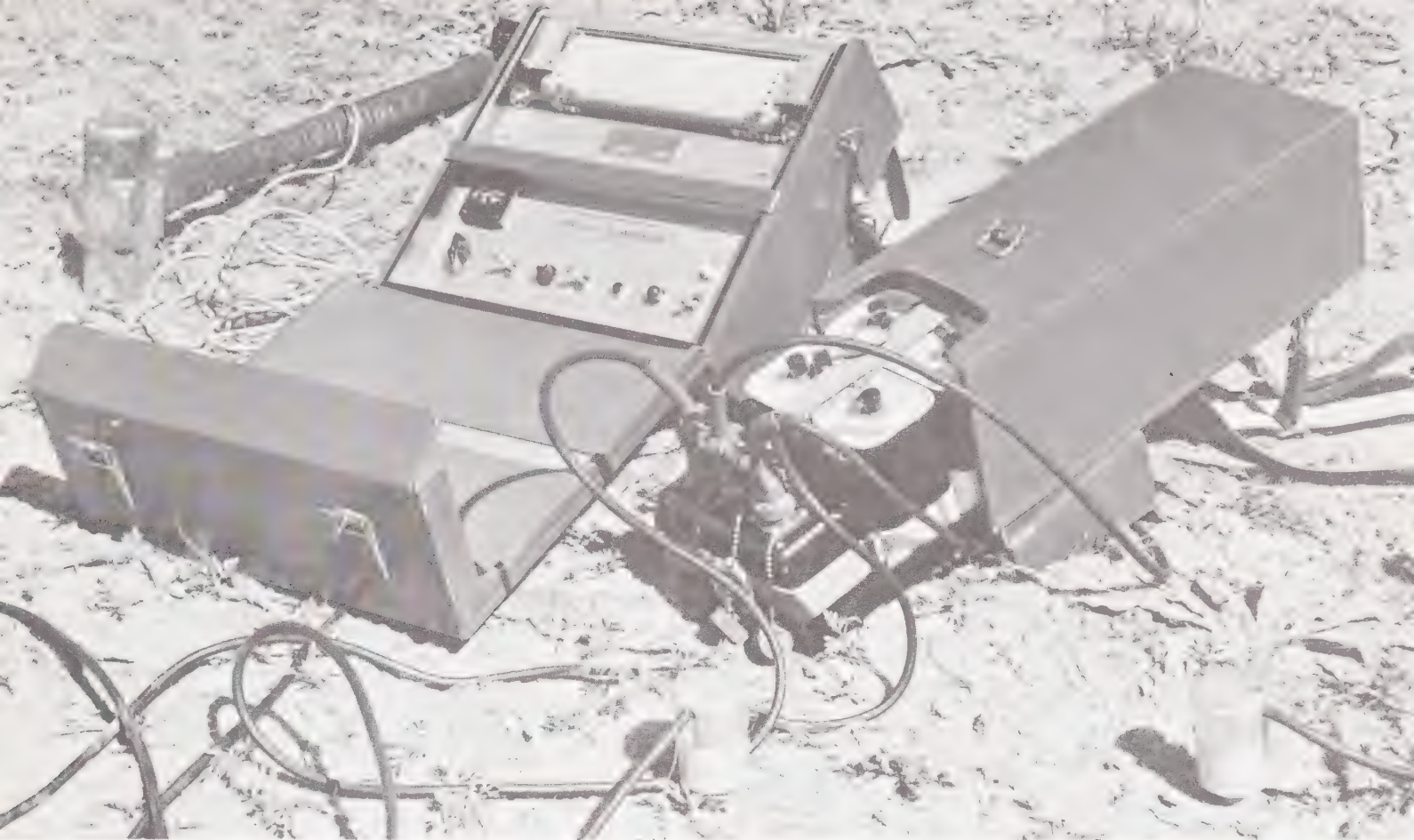


J. V. Grose,  
Chief, Aerotechnical Division









Facsimile seismograph FS-2 designed and manufactured by Hunting for bedrock determination.



## Photogrammetric Mapping

### CITY ENGINEERING AND UTILITIES MAPPING

The rapid growth of Metropolitan Toronto has created immense problems for those responsible for providing and maintaining the expanded services needed. The increase in transportation alone has meant not only wear and tear on existing roads, but the necessity to increase the capacity of these roads, especially at rush hours.

Planning for new buildings, new industry and subways, both within the city and surrounding areas, has meant widening, realigning and improving many miles of roads, involving co-operative planning with the public utilities and services.

The Metropolitan Roads Department has for many years used ground survey methods for

producing and revising location plans of existing roads. These show all details of a permanent nature, including street hardware and utilities, as information for planning purposes.

Ground survey methods of producing these road plans have proved to be laborious and costly. In addition, the rapid growth of Toronto, and the consequent increase in traffic, has made such work most difficult.

The adopting of aerial survey methods has made it possible to produce, in two years, information which would have taken ten years by conventional ground methods. Further, the cost of producing these plans has been reduced by two thirds, while the amount of detail obtained has been substantially increased.

During a three year period, hundreds of





IBM 7070 Computer used for computing and tabulating earthwork quantities.



Wild A7 mapping instrument with EK-3 electronic co-ordinate printer attachment.

miles of detailed 1:500 scale road location plans have been produced by Hunting Survey Corporation for the Metropolitan Roads Department, by the combination of aerial survey techniques and ground checking. The availability of complete and up-to-date maps results in greatly increased planning flexibility, with the possibility that much basic work can be carried out in the engineer's office.

## LAND CLASSIFICATION

Land classification is an essential element for development planning, whether of a whole country or a town. Physical descriptions by land type, present land use and use-limiting factors, and land-use capability mapping are typical forms of classification where photo interpretation can be exceedingly valuable and highly complementary to field work.

HSC specialists have collaborated with urban planners in the classification of lands in and around many population centres. A typical rural land classification was recently completed for the Government of Chile, on the Island of Tierra del Fuego. Photo-interpretation, based on limited field descriptions, was used to determine landforms, vegetation types and physical limiting factors for sheep and cattle ranging.

Field survey to determine soil characteristics was then used to establish a series of

**For geographical reasons Hunting has branches across Canada to provide better service for clients:**



W. A. Scott, B.A.,  
Manager,  
Montreal Branch



A. J. O'Gorman,  
Manager,  
Calgary Branch



N. E. McConnell, B.A.Sc.  
Civil Engineer  
Manager,  
Vancouver Branch



N. W. E. Lee, B.Sc.  
Civil Engineer  
route location specialist





## LEYENDA

# CLASIFICACION DEL TERRENO

VEGETACION NATURAL  
ACTUAL DEL TERRENO

	PRADERA DE TIERRAS ALTAS UPLAND PASTURE
	PRADERA DE TIERRAS HÚMEAS WETLAND PASTURE
	VEGETACION ARBOREOLIVA FOR VEGETATION
	ARBUSTOS Y PASTOS SCRUB AND GRASS
	TIERRA MPR. DE TIERRA MPR. SA TET SCRUB, GRASS UNPRODUCTIVE
	TIERRA MPR. DE TIERRA UNPRODUCTIVE LAND
	TIERRA CULTIVADA CULTIVATED LAND
	PRADERA DE TIERRAS ALTAS Y TIERRA MPR. SA UPLAND PASTURE AND UNPRODUCTIVE LAND
	TURBIA BLG
	BOSQUE WETLAND

capability classes which have been used to plan redivision of ranges into economic units. A revaluation has then taken place, taking into account both present usefulness and the possibility of improvement by seeding.

With increasing population pressures, the high value of such land studies can hardly be exaggerated.

## TAX MAPPING

Maps prepared specifically for tax administration purposes are recognised as essential to efficient and equitable assessment. Factors in assessment are: area, value of improvements, actual land use, and land use capability.

These data can be obtained and presented most effectively through a combination of photogrammetry, photo-interpretation and field checking. Scales will vary according to type of culture. For instance, in rural areas, maps at 1:10,000 to 1:20,000 are adequate, as for recent surveys of the agricultural lands of Chile, whereas for urban zones, scales of 1:500 or 1:1,000 will be needed.

It is usual for tax maps to show for each property: its boundaries, its area and an identifying number corresponding with indexing cards recording details of ownership, assessed value, etc. Such maps and records are kept continually up-to-date, thus maintaining their highest value.

The economic effect of intelligently applied land taxation is to bring about proper use and distribution of lands, both urban and rural.



## Research and Development

*"Research is the future life blood of any organization".*

For the past fifteen years HSC has had an active Research and Development Division. Successes achieved include the following:

### **AIRBORNE PROFILE RECORDER (APR)**

This instrument, which provides by radar the vertical control needed for certain types of mapping, has been licensed for manufacture and is now in wide use by civil and military mapping organizations.

### **ELECTROMAGNETIC GEOPHYSICAL INSTRUMENTS**

HSC has pioneered in the development of electromagnetic methods for geophysical prospecting. Starting with a fixed wing airborne system in 1952, the first available to industry on a contract basis, it then developed a whole range of helicopter-borne, truck-borne and man-borne units. No less than 90 of HSC's two man ground units are currently in use with the mining industry. HSC's airborne systems have had a discovery success ratio far surpassing that of any other system.

### **AUTOMATION IN PHOTOGRAMMETRY**

HSC's recently developed Stereomat

system is the first and, so far, only successful method for mapping automatically from air photographs. The first unit, fitted to a projection plotter, achieved four times human speed with comparable accuracy. A new unit is now being adapted to an optical/mechanical plotter under a development contract with the U.S. Army Map Service. This instrument will be many times faster than the prototype and may well revolutionize photogrammetry.

### **GROUND GEOPHYSICS**

Apart from the electromagnetic systems, successful geophysical instruments embodying new features have been developed in the fields of shallow seismics (FS-1 and FS-2), water-borne seismics (Hunting Hydrosonde) and Induced Polarization.

### **FUTURE RESEARCH**

HSC is continuing actively in research and expects to produce regularly in the fields of photogrammetry, survey and geophysics new devices and methods with which to improve techniques and reduce costs. Current investigations include airborne gravity and orthogonal photography.





Vaino Ronka with the Hunting fixed wing electromagnetometer. As development engineer for Hunting, Mr. Ronka has been responsible for several airborne and ground electromagnetic systems as well as ground and underground seismic units.



R. W. Hutchins, B.Sc., Division chief, Research and Development — Airborne Devices.



G. L. Hobrough, with his invention Stereomat.





## **THE INTERNATIONAL HUNTING GROUP**

The Hunting Group consists of an extensive complex of companies engaged in the fields of shipping, oil marketing, manufacture, aviation, air, ground and resources surveys.

The Group started in England in 1874, when a member of the Hunting family bought a ship from New Brunswick. Since then it has set up companies or formed associations throughout the world.

The survey side of the business has two main bases, England and Canada. The London based company has associations throughout Europe and Africa, while the Canadian company has branched into the United States and Latin America. In most countries associated companies are owned in whole or in part by local capital, but by working together ideas, experience, research and equipment are exchanged to mutual benefit.

Associated survey companies and representatives throughout the world are listed on the following pages.



## South America

### ARGENTINA

Aeroexploracion S.A., *Associate*  
Uruguay 1037,  
Buenos Aires

Instituto Foto-Topografico Argentino, *Associate*  
Independencia 2844,  
Buenos Aires.

### BOLIVIA

Dr. Freddy Reynolds, *Representative*  
Calle Mercado No. 266.  
Edif. Guerrero, Piso 1,  
(Casilla 1520),  
La Paz.

### BRAZIL

Prospec Levantamentos, Prospeccoes e Aerofotogrametria,  
S.A., *Associate*  
Ave. Gen. Justo #275, Grupo 305,  
Rio de Janeiro, D.F.

### CHILE

Carlos Pentz R., *Representative*  
Casilla 2839,  
Matias Cousino 72,  
Santiago.

### PERU

Mr. Theodore Kiendl, Jr., *Representative*  
Avenida Tacna 592, Of. 42.  
(Casilla 2781),  
Lima.

### VENEZUELA

Aeromapas Seravenca S.A., *Associate*  
Apartado No. 1128,  
Avenida Venezuela No. 20,  
Quinta Seravenca,  
Urbanizacion El Rosal,  
Caracas.

## Caribbean

### BRITISH HONDURAS

Mr. W. Ford Young, *Representative*  
P.O. Box 343,  
Belize.

### JAMAICA

Lascelles, de Mercado Ltd., *Representative*  
14½ Port Royal Street,  
(P.O. Box 116),  
Kingston.

### PUERTO RICO

Mr. Harry Wassall, *Representative*  
Harry Wassall & Associates,  
P.O. Box 1696,  
Hato Rey.

### TRINIDAD

Dr. Alan R. Richards, *Representative*  
Knightsbridge,  
Cascade,  
Port-of-Spain.

## Europe

### UNITED KINGDOM

Hunting Surveys Limited, *Associate*  
Hunting Technical Services Limited, *Associate*  
6 Elstree Way,  
Boreham Wood,  
Herts.

### FRANCE

Société Anonyme de Prospection Aeroportée, *Associate*  
92 Avenue de Champs Elysses,  
Paris 8.

### ITALY

Compagnia Aeroricerca, *Associate*  
Via Torino 40,  
Rome.

### PORTUGAL

Tecnica Aerea e Fotogrametrica Ltda., *Associate*  
Rua Maria 48,  
Lisbon.



## Africa

### EAST AFRICA

Hunting Surveys (East Africa) Limited, *Associate*  
Church House,  
Government Road,  
P.O. Box 30015,  
Nairobi.

### GHANA

Hunting Surveys (Ghana) Limited, *Associate*  
P.O. Box 242,  
Accra.

### SOUTHERN RHODESIA

Hunting Surveys (Rhodesia) (Pvt) Limited, *Associate*  
P.O. Box 3621,  
28/30 Salisbury Street,  
Salisbury.

### SOUTH AFRICA

Aircraft Operating Company (Aerial Surveys) Limited, *Associate*  
Aircraft House,  
23 Rogers Street,  
Selby, Johannesburg,  
(P.O. Box 2830, Johannesburg)

## Asia

### W. PAKISTAN

Hunting Surveys (Pakistan) Limited, *Associate*  
1 West Wharf Road,  
P.O. Box 4216,  
Karachi 2.

### THAILAND

Diethelm & Co. Ltd., *Representative*  
G.P.O. Box 14,  
Bangkok.

### PHILIPPINES

Theo Davies (Far East) Ltd., *Representative*  
Bonifacio Drive Corner,  
25th Street,  
Manila.

## Australasia

### AUSTRALIA

Adastra Airways Pty. Limited, *Associate*  
Adastra Hunting Geophysics Pty. Limited, *Associate*  
41-45 Vickers Avenue,  
Mascot, Sydney,  
New South Wales.

### NEW ZEALAND

New Zealand Aerial Mapping Limited, *Associate*  
Queen Street,  
Hastings.







AR28

# HUNTING GROUP REVIEW

SHIPPING · OIL · AVIATION · SURVEY / NUMBER TWO 1958







OUR COVER shows a typical young Ethiopian girl bedecked with national colours. John de Kock, 35-year-old author of this article, joined Hunting Aerosurveys in May 1957 specially to lead the surveying party for the highway location survey in Ethiopia, undertaken jointly by Huntings and Bolton, Hennessey & Partners for the Imperial Highway Authority



# Highways for Ethiopia

*Hunting Aerosurveys' work in Ethiopia is of particular interest: it is almost the only country in Africa in which the Company had never operated; it is a country for which Britain has always had a tremendous amount of affection and respect and, thirdly, the Company was honoured by a personal visit to its Elstree headquarters by His Imperial Majesty, Haile Selassie I, in 1954*



*(Left) This bridge across the Blue Nile is one of the present examples of the shape of things to come with the new highway programme*

*(Above) The Emperor of Ethiopia at the Company laboratories in Elstree during his State visit to Britain in October 1954*

ONE night early in the New Year a small group of engineers and surveyors, including the writer, sat huddled around the pressure-lamp in their mess tent, drinking coffee and listening to a young Ethiopian. Outside a chill damp wind moaned through the guy ropes and tugged at the tent walls. The camp was pitched on the slopes of an exposed hill near Debra Marcos, a small village in the Ethiopian highlands, lying ten hours' bone-jarring drive by Land Rover from Addis Ababa.

Our guest, a buyer of farm produce, spoke of his country's vast agricultural potential, and the primitive wasteful farming methods of the peasants. He was concerned at the way young Ethiopians tended to migrate to the large towns in search of "white collar" jobs, and stressed the need for more agricultural colleges to teach them crop rotation, the use of fertilisers, and modern farming methods. But above all, he spoke of the lack of roads and transportation. At the time he had oil-seed valued at over £25,000 in his warehouse, but he was unable to find transport to freight it back to Addis Ababa.

In a few words, this young man had outlined his country's major problem. The Ethiopian Empire covers 350,000 square miles and is a land of towering mountain ranges, lush green valleys, flat featureless plains and bleak desert. Large areas are isolated and inaccessible and, without adequate communications, their potential cannot be utilised. This is particularly true of the coffee areas. Coffee is by far the most important of Ethiopia's exports and accounts for 60 per cent. of her total income from exports. Three-quarters of the crop is obtained from wild trees, and in the south-west there are extensive areas which are untouched due to inaccessibility. It is estimated that present output could be doubled if progressive methods were introduced and roads constructed to link these untapped areas with the capital.

## **Present Programme**

Responsibility for the improvement, maintenance and extension of the nation's roads is vested in the Imperial Highway Authority. In October 1957, the World Bank made a loan of U.S. \$15,000,000 to

Ethiopia for its highway programme, which is to maintain and extend the country's all-weather roads to approximately 3,500 miles.

Several new roads are included in the programme and the Imperial Highway Authority engaged a British firm of consulting engineers, Messrs. Bolton, Hennessey and Partners, together with Hunting Aerosurveys Limited to carry out the location, survey and design of 535 miles of new roads to be constructed under the current project. In addition, a further 375 miles of new roads are to be located and designed, although construction is not covered by the present loan.

Construction will be carried out under the supervision of the Imperial Highway Authority and contracts will be awarded on the basis of international bids.

## **The Ethiopian Empire**

It is said, and believed by many, that the Queen of Sheba once ruled Ethiopia, or Sheb, as it was then called. During her reign she visited King Solomon in far-off Israel, where she stayed for some time and became the King's wife. A son, Menelik





the First, was born of this marriage and it is alleged that the line of descent of Ethiopia's Emperors has remained unbroken from that day to this. Her present Emperor, the moving power behind the Government, is His Imperial Majesty, Haile Selassie I, Emperor of Ethiopia, King of Kings, Elect of God and Conquering Lion of Judah. A just, shrewd and knowledgeable ruler, his people are devoted to him.

Addis Ababa is the hub of all Ethiopia and lies roughly in the centre of the Empire. With an estimated population of 500,000 it is one of the most cosmopolitan cities in the world. Apart from Amharic, English is widely spoken and is in fact the second official language of the country.

The capital is a city of contrasts, with no definite zoning pattern, and sprawling in character. Contemporary buildings jostle mud huts, tarred roads are linked by appalling tracks, and latest model motor cars jockey for position with gharries in the overcrowded streets. The police are

there are several good schools; one of them boasts 23 nationalities among its pupils.

But the true Ethiopia only starts beyond city limits, out in the mountains and plains where her 15,000,000 inhabitants till their fields and tend their cattle. Five roads lead out from Addis Ababa. These appear to be mainly occupied by Ethiopia's estimated 3,000,000 asses, which have an uncanny knack of crossing the road at the precise moment one wishes to overtake them. With the exception of the main road to the north leading to Assab on the Red Sea and Asmara in Eritrea, travelling on each of these roads is hazardous after the first 200 miles which is about the extent of the all-weather surfacing.

The southern and main road to Kenya passes through the Rift Valley and a string of beautiful lakes, teeming with fish. Around their shores birds of every description strut and hop. Pelicans, flamingoes, wattled cranes, storks, duck and geese can be seen in abundance.

To the west and south-west two roads pass through rolling fertile hills before entering the coffee country. Here the wild coffee grows in profusion, in the shade of dense forests. This area has the highest rainfall in Ethiopia and travelling during the wet season is a nightmare with every yard gained a major accomplishment.

The north-western road leads to the Blue Nile and across it. Through the centuries this river has cut a gorge a mile deep and 10 miles wide. The plateau on either side is fertile, but within the gorge vegetation is sparse and the population have a reputation for banditry.

Ethiopia's solitary railway line runs in an easterly direction from Addis Ababa to the port of Djibouti in French Somaliland, traversing the southern fringes of the

closer contact with welfare organisations and provide them with a better standard of living through higher prices for their produce. Such is the purpose of the present project.

### Aerial Photography

They say in Ethiopia that the weather is governed by the clock. In the highlands, for example, the heavy rains are from July to September and rainfall can be as high as 40 to 50 inches. During this grey and miserable period one is told that at 12.00 hours on September 15th the rains will cease and thereafter, as an Italian acquaintance put it, one becomes "sick of visibility". Nothing can be further from the truth as patient cloud-watching aircrews know only too well.

Existing maps of Ethiopia are of little value for highway location, the largest scale available being 1:500,000. Early in 1957 the Imperial Highway Authority wisely decided that aerial photography was essential to enable optimum routes to be selected, and Hunting Aerosurveys Ltd. were awarded the contract to photograph 70,000 square miles of the country. During the dry season October, 1957—January, 1958 three aircraft were currently engaged on this task.

Weather is not the only problem. Photographs were required at 1/20,000 scale (10,000 feet flying height) and although the average height of the Ethiopian plateau is 8,000 feet above sea-level, there are numerous mountain ranges of 10,000 feet with isolated peaks rising to 15,000 feet. Careful planning was, therefore, necessary.

### Ground Control

In broken country, medium-scale photogrammetric maps are invaluable to the location engineer, and Hunting Aerosurveys Ltd. have positioned a team of tellurometer operators with a master and two remote instruments to establish ground control for such mapping in Ethiopia.

Very briefly, the tellurometer measures electronically the time taken by a radio wave to travel from the master or transmitting instrument to the remote or reflecting instrument and back again, and thereafter the distance between them is computed. Effective range is between 500 feet and 40 miles, and both instruments are equipped with built-in radio telephones. The advantages of the tellurometer in eliminating the tedium of conventional survey and ensuring greater accuracy are enormous.

This is not apparent to the "locals", who view both operators and instruments with a mixture of suspicion and awe. As unfamiliar with the telephone as they are with the tellurometer itself, it must seem crazy for a man to carry heavy pieces of equipment to the top of a hill, apparently for the sole purpose of talking to himself for half an hour, before making his descent.



*Hunting survey crews parade in front of their aircraft at Addis Ababa*

efficient, and beware the motorist who tries to "shoot" a changing traffic light.

There are excellent hotels, a comprehensive if expensive shopping centre around the piazza, a theatre, several cinemas, a nine-hole golf course and a neat race-track complete with tote. Life can be very pleasant for the foreigner on his overseas tour. Education is no problem, as

forbidding Danakil desert. South of it, rough tracks climb into the Ahmar mountains, with deep valleys rich in neat plantations of cultivated coffee.

Amongst all this beauty and plenty, the Ethiopian peasants live in indescribable poverty, under the most primitive conditions. It can only be hoped that better lines of communication will bring them into



## Training Ethiopians

At the request of the Imperial Highway Authority, Hunting Aerosurveys Ltd. have also established a photographic and photogrammetric mapping unit in Addis Ababa. The equipment (including a stereo-plotting instrument of the multiplex type) has been purchased by the Authority and is being operated by Hunting's technicians for the duration of the current highway project.

Primarily the unit's purpose is to provide photogrammetric plots from the ground control established by the tellurometer; copy, enlarge or reduce mosaics; print aerial photographs and generally supply the surveyors and engineers with all the initial data they need on road surveys.

In addition it is designed to train Ethiopians in the use of this equipment, to provide the Imperial Highway Authority with a nucleus of skilled men to be absorbed into their organisation eventually. This is a big and important task but the educated Ethiopian is impatient in his thirst for knowledge.

## Road Surveys

It was stated in an earlier paragraph that the Imperial Highway Authority had engaged British consulting engineers together with Hunting Aerosurveys Ltd., to carry out the location, survey and design of several hundred miles of new roads. Hunting's role in this association is to provide the field surveyors.

The Debra Marcos team is one of five field-teams operating in different sections of the country. Generally, each team consists of a highway engineer, who is the party leader, a location engineer and two or three surveyors. With the aid of photographs, mosaics and photogrammetric plots the location engineer selects his route, and the team of surveyors follows up fixing topographical detail, contouring and relating the whole to the preliminary alignment. This work is plotted, and on these plots the highway engineer designs his road; from then on it becomes purely an engineering problem, discussion of which is not the object of this article.

Life is not unpleasant in the camps. Each man has his own tent, and a mess tent and office tent are provided for each camp. Refrigerators with locks are supplied, and apart from their obvious advantages, they make excellent depositories for "frozen assets". It is not unusual to find a couple of thousand Ethiopian dollars stacked in the ice-tray.

Wherever possible Land Rovers are used, but frequently proposed routes lie considerable distances from existing tracks and more primitive but practical means of transportation have to be utilised—generally mules. Ethiopian saddles are made of wood with prominent pommels both fore and aft. Their intended purpose is obscure, but most surveyors clutch them firmly with both hands in their efforts to



*A typical 'all-weather' road in Ethiopia today*



*The result of a skid. As always in any country, there are interested spectators*



*Ethiopian trainee seen in Hunting photographic section at Addis Ababa. The Hunting survey group pays keen attention to local training wherever it operates*

remain seated, much to the disgust of the local inhabitants. The Ethiopian is a magnificent horseman, although his riding habit is unorthodox. The well-dressed man wears white jodphurs (with no shoes), a flowing white muslin cloak or "cuta", sun-helmet and in his left hand he holds aloft an enormous black umbrella—even at the gallop.

## A Great Future

It seems almost certain that the Empire of Ethiopia is destined for a prosperous future. Expert foreign advice is eagerly sought and it is a pleasure to work with her friendly and courteous people.

Her mineral and natural resources are virtually unknown but indications are promising. Industry, agricultural research, animal husbandry, forest control, education and health services are all in their infancy, but a start has been made and the people are eager and willing to learn. It is necessary, however, to temper their enthusiasm and bring it home that expert knowledge cannot be acquired overnight.

To this day, the origin of the Ethiopian peoples is largely unknown. True Ethiopians are a handsome, golden-skinned people. Many are quite fair, and are fine featured and fine boned, with dark eyes, thin lips and straight noses. Written Amharic, the present language of Ethiopia, is related to both Hebrew and Arabic and is believed to be of Semitic origin.

Isolated from the rest of the world, Ethiopia has always been self-supporting with a highly developed agriculture, which has been helped by her mild climate and fertile soil.

With the help of strict control, all of the well-known big game animals are to be found in Ethiopia. Elephant, buffalo, rhino, giraffe, zebra, warthog, antelope, gazelle, leopard, lion, cheetah and other members of the cat family are scattered throughout the country. Game birds are plentiful and varied and the lakes and rivers abound in fish.

Modernising Ethiopia is largely through education. There has been an intensive expansion and modernisation of the school system, and foreign advisers and technicians also train the local people. Many Ethiopians, too, have been sent abroad to study.

A major factor has been Ethiopian Airlines which have done a great deal to open up the country to the outside world; and another is the present road development programme, in which the Hunting Group is proud to play its part.



# Ore Carriers



DURING the course of the last eight years the shipping lanes of the world have seen the introduction of a new and highly specialised type of vessel. It is a type which is of particular interest not only on account of its design and handling arrangements, but because it reflects so clearly the immense growth in recent times of industry in general—the development of all those manufacturing activities which call for constantly increasing supplies of base metals to keep them in business. Metals are refined from ores, dug in prodigious quantities by mechanical draglines and scoops from opencast mines; and these ores—which vary in appearance from yellowish clay to iron-grey lumps weighing heavily in the hand—must then be shipped in bulk to the blast furnaces and refining plant of countries all over the eastern and western hemispheres. If a graph were drawn of world metal consumption since, say, 1936, it would show a steepening curve over the war years and then an abrupt upward trend which not even the most farsighted experts in 1936 could ever have forecast; iron ore imports into Great Britain, for example, have risen by well over 130 per cent. since 1947 and during the next five years the country's steel industry intends to increase its productive capacity by roughly the same annual tonnage as it has achieved during the last ten. This trend is typical of a score of other countries, and particularly of the United States, which is the world's largest ore consumer.

Now this growth in bulk movements by sea, which used to be handled before the war almost entirely by ordinary tramp cargo ships of 5,000 to 10,000 tons deadweight, has caused the development of the special-

ised class of ore carrier employed full time on this service. It was only comparatively recently that shippers realised that, unless decisive steps were taken, there was simply not going to be enough tonnage to meet the requirements of the ore trade—Lloyds' introduced ore carriers as a separate classification for the first time in 1955—and it was BISC(Ore) Ltd., the British Iron and Steel Corporation's ore division which acts as the central importing agency for the industry, who were largely responsible for encouraging owners at the outset. Seventeen of these specially designed vessels are already on the high seas under the Red Ensign, a further twenty or so will be launched within the next twelve months, and altogether no less than 72 ore carriers will be operating under BISC(Ore)'s control by the summer of 1962. During this comparatively short time, also, the classification societies of other seafaring countries—Det Norske Veritas, the American Bureau of Shipping and the Bureau Veritas of France—have all introduced regulations for the construction of ore carriers, and vessels from their yards will be plying the sea routes across the Pacific, from Latin America to Baltimore, and from North Africa to Europe in growing numbers to feed the industries of consumer countries.

Having been one of the U.K.'s pioneers in the carriage of bulk petroleum by sea, and having specialised in this trade ever since, Hunting and Son Ltd. have now broken away from their traditional activity and ordered a motor ore carrier of 15,000 tons deadweight, which will be delivered in 1962. Late last year they launched a bulk-carrying motorship of approximately this tonnage, the *Inverfield*, which is rather different in design from a pure ore carrier

as she is constructed to carry other bulk cargoes, such as coal and wheat, besides ore; her launch was an historic event as it was the first for almost exactly fifty years of a Hunting dry cargo vessel. It is worth noting, incidentally, that the Hunting Group itself is no newcomer to the raw materials of base metals; among its survey companies on the aviation side are three who specialise in the detection of valuable ore deposits with aircraft mounting electronic geophysical gear, and their teams have revealed the existence of hitherto undiscovered minerals in countries as widely spaced as Canada, Norway and the Philippines. The day will shortly come when a Hunting ore carrier ships the spoils of a deposit pin-pointed by one of the Group's survey expeditions.

## Design and Construction

The modern ocean-going ore carrier is a utilitarian but nevertheless handsome vessel, strongly built to withstand the heavy usage of a hard trade. She is designed to be "turned round"—that is to say, loaded and discharged—as quickly as possible, for speeding the turn-round of a ship is equivalent to expanding the fleet, and port dues are high. All the specialised ore carriers are motorships—that is, with diesel machinery—and in appearance they are not unlike the oil tankship, most of them having machinery and accommodation aft with sometimes a centrecastle from which the ship is conned; but more of this later.

Structurally, the hull of the ore carrier has an interesting family affinity with that of the tanker, both types of vessel being characteristically long with approximately the same length to beam ratio. One of the problems which always confronts the naval



architect is longitudinal strength; in heavy weather, the hull of a laden vessel may be in such condition that it is supported at each end by a wave crest, so that the centre part is no longer buoyant but is said to "sag". Alternatively, the hull may be lifted a trifle by a wave crest under its centre, so that both fore-foot and screw are out of the water; under these conditions the ends are unsupported and the hull is said to "hog". As can be imagined, hogging and sagging place severe strains on the vessel and considerable skill is needed to load her in such a way as to reduce hull stresses; inefficient loading and poor handling at sea can break a ship's back, and these disasters still occur from time to time. Sufficient longitudinal strength, therefore, is of paramount importance; and in a tanker, which has no double bottom forward of the cofferdam, the principal loads are taken by the main deck, which is not weakened by large hatches and which can be made to run continuously forward to aft. The centre and wing tanks themselves are formed by watertight longitudinal and transverse bulkheads also contributing to the strength of the hull, which can thus be considered as a cellular girder of great rigidity.

The ore carrier's main deck, however, is pierced by large hatchways to facilitate cargo unloading by high-speed grabs, and consequently this source of longitudinal rigidity is lost; but, fortunately for the designer, the very nature of the cargo she carries enables him to employ tanker type longitudinal bulkheads, spaced well in from either beam for stiffness, without impairing either her deadweight or turn-round times. The reason for this is the extraordinarily high densities of most ores; whereas some crude oil derivatives stow at 41 cubic feet per ton, many iron ores weigh one ton for every fourteen cubic feet and sometimes, as with Gellivare, an iron ore which is shipped from Gellivare in Lulea, Sweden, a mere 13.2 cubic feet will take up a ton of the ship's deadweight. When an ore carrier comes alongside her discharging berth and the steel hatches are winched back to disclose the holds, the piles of ore in the bottom of each often seem unbelievably small—and yet the ship will be down to her marks.

This high cargo density means that the holds can, in fact, be designed as narrow, simple boxes, with vertical sides formed by the stiffening longitudinal bulkheads so necessary to the torsional strength of a long hull, and with ends formed by the transverse bulkheads running from side to side. The floor of the hold is the tank top itself (the top surface of the standard cargo vessel's double bottom which carries bunkers and ballast); and the tank top of a modern ore carrier can be as much as one inch thick—a tremendous weight. Great strength is necessary here because ore cargoes are generally loaded by shute, some two thousand tons coming crashing down

from a height in a matter of minutes into each hold; load concentrations are high when the ore is aboard—being greater in the centre than at the sides owing to the piling effect—and when the vessel reaches her discharge port the shore grabs scrape over the hold bottom as the last few tons are fetched out. To reduce the chances of damage, tank top plates are therefore generally butt-welded so as not to present a proud edge to the jaws of the grab, and naval architects usually prefer not to have an area of more than one square yard unsupported by floors and intercostals beneath.

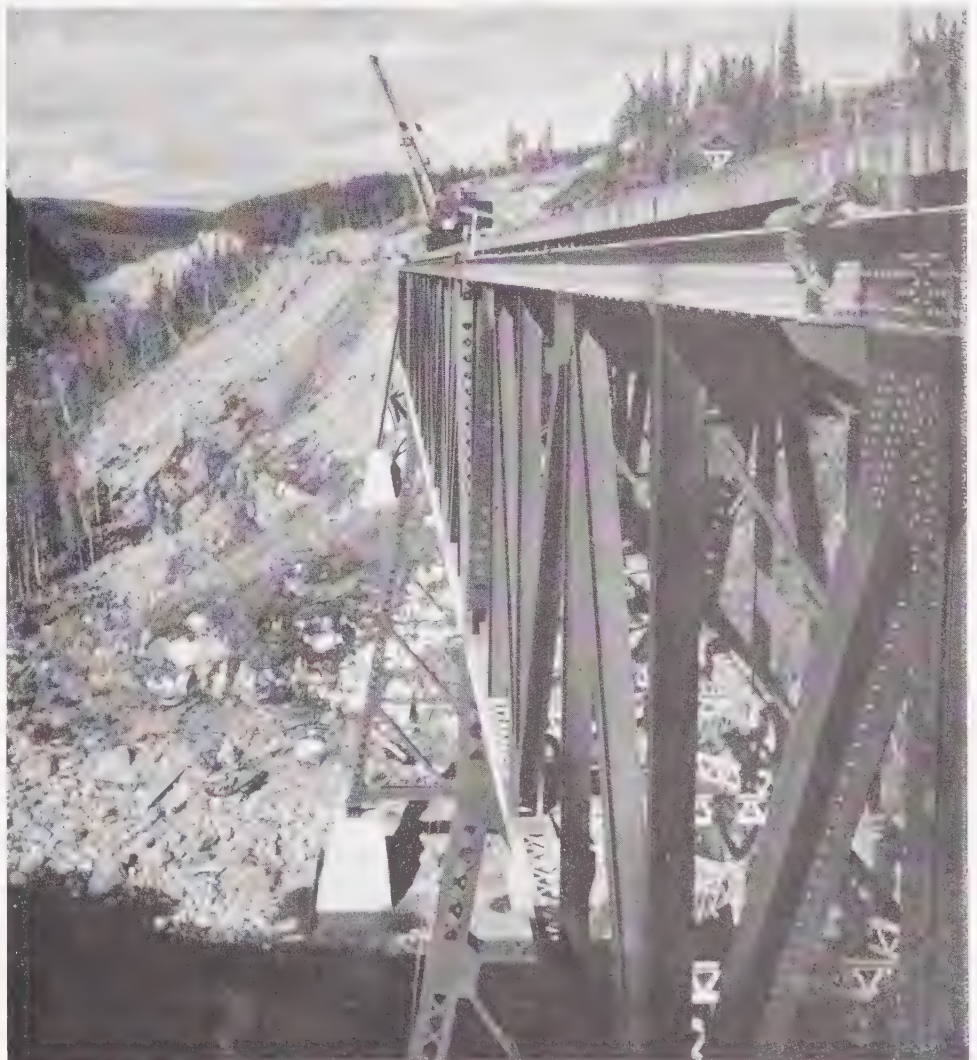
The plain box design of the holds is ideal for rapid discharge, but there is another unit whose efficiency is of great importance, and this is the hatchcover. Some ore carriers have a low freeboard, like a tanker, while all are likely in heavy weather to ship a sea over the main deck, and therefore the tops of the holds must be watertight otherwise dangerous flooding might result. The hatches must be large, with little or no deck "overhang" if the unloading grabs are to work fast, and this means large hatchcovers; yet in spite of their size these

must not be difficult to open or shut, or much time and energy will be wasted.

The modern ore carrier's hatchcover, which is almost always of the MacGregor type, is in its way a masterpiece of ingenuity and easy handling. Projecting upwards from the edges of the hold is the hatch coaming, and along this slides the MacGregor steel hatchcover, hinged so as to stow itself concertina-fashion when opened. The usual method of opening the covers is to winch them back by wire warps made fast to king posts at the fore and after ends of the main deck, but recently Swedish builders have introduced hydraulic opening machinery which would appear to be better since it will obviate the need for running gear on a working deck. With either system, all hatches can be opened in a matter of seconds at the touch of a switch; and since the covers are airtight in the closed position there is no need to install the customary CO<sub>2</sub> fire systems in the holds.

Of particular interest and importance in the design of the specialised ore carrier is the question of ballast. Any ship, once discharged and therefore riding light, would be unmanageable in a seaway with

*A bridge on the Quebec North Shore and Labrador Railroad, along which twelve million tons of ore a year are brought from the Knob Lake mines to the Sept Iles loading installation*





the tips of her screw and most of the bow clear of the surface; admittedly, modern designs of rudder often allow for ample steerage of a light ship, but in a seaway "pounding" of the exposed forefoot can often dent both plating and frames. Moreover she would be top-heavy and in danger of capsizing unless in perfectly calm water. An empty ship is therefore ballasted with sea water for the voyage to her next port of call, the position of the ballast tanks depending on the type of vessel. An oil tanker pumps sea water straight into the empty cargo tanks, which incidentally has a scouring and cleaning effect; the standard dry cargo vessel has ballast space in the double bottom and deep tanks, but the ore carrier, which must possess a very considerable hull buoyancy to support the deadweight of a dense cargo, must therefore have sufficient ballast capacity to compensate for its absence after unloading.

To accommodate the sea water the wing tanks, formed by the longitudinal bulkheads and the ship's side on either side of the ore hold, are used. The initial drawings prepared by Smith's Dock Co. of the Hunting new building show extensive wing

ballast tanks which have no double bottom, the tank top being only a narrow strip between the two longitudinal bulkheads, and this is a practice now widely followed.

The speed at which the ship's pumps can discharge ballast is of importance, because there will normally be no time to pump it out at the loading-berth—at Sept Iles, on the St. Lawrence in Canada, a 15,000 tonner takes but two hours to load—and at the same time the ship's master will not want to take her through a rough water approach to harbour in an unballasted condition. As a general guide, the ship will not be delayed by partial ballasting if she can pump out roughly 8 per cent. of her total ballast capacity every hour.

Some ore carriers are now in service as dual purpose vessels, being designed for cargoes of oil or ore, depending on the season. The standard carrier loads ore outbound and then ballasts homeward, whereas the ore/oil ship—of which the *Sinclair Petrolore* is a striking example—can be used on either service as the market dictates. Oil cargoes are carried in the ballast tanks, as is customary in the normal oil tanker. It can be seen, then, that there

is a certain family resemblance between the tanker and the ore ship, not only in design but also in operation—both types ply between specialised terminals on a voyage or time charter basis. There is, however, one final constructional difference, and this is that the ore ship's bow is nearly always strengthened for navigation in ice. The trade takes these vessels along routes in high latitudes, where ice can be encountered during the approach to harbour; consequently the additional strength to their hulls is achieved by inserting extra frames, floors and longitudinals and thickening the shell plating on either bow up to the stem.

A fine example of one of these modern vessels, incorporating all the design points which make them so efficient for their specialised duties, is the 28,000 ton deadweight bauxite carrier *Sentinel*. She was launched three years ago by A/B Lindholmens Varv for the Pan Ore Steamship Co. Inc. of New York, and is now employed in bringing ore to the extensive aluminium refineries at Mobile, in Alabama; of typical ore carrier appearance, she carries her 6,000 B.H.P. Gotaverken diesel and most

*Rapid unloading is in full swing as the ore carrier lies alongside her discharge berth. Notice the hatchcovers on the main deck, in the upright open position. Few people are about, for the mechanical shore installation allows a rapid turn-round with the minimum human effort*







*As the last few tons of cargo are taken out calf-dozers are lowered into the holds to push the remaining ore under the jaws of the grab (left). On the ship's main deck can be seen the strips each side of the hatches, which form the tops of the extensive ballast tanks; the centre-castle is built especially narrow so as to interfere as little as possible with the grabs as they are dropped in and hoisted out (centre). The shore installation cranes at Tyne Dock have 'kangaroo' type hoppers into which the grabs are directly discharged (right), thus saving time*

of the accommodation right aft. The question of where a ship should be steered from is one which has exercised the minds of shipowners for some time; clearly, if the wheelhouse can be aft then the whole deck presents an unimpeded expanse to the unloading grabs, thus allowing more convenient working and less chance of damage. But when conning a ship from aft, the Master may feel that he is too far from the prow to keep an adequate look-out. In general, experience indicates that vessels under 500 feet long can be navigated from this position; but the *Sentinel*, being over 630 feet long, carries a high navigating bridge of modernistic appearance amidships, which has been kept very narrow longitudinally by its builders so as to interfere as little as possible with the shore installation's grabs as they are lowered into the holds. In this narrow slip of superstructure are also the captain's quarters and those of the chief, second and radio officers; all the accommodation, both here and aft, is air conditioned, the air being specially dust-filtered by means of washing.

In this vessel, which incidentally was built to both Lloyds + 100 A.I and American Bureau of Shipping rules, the ore is carried in four holds totalling 810,000 cubic feet, two being aft of the centre-

castle and two forward, with a deep tank between. Each hold has MacGregor hatch-covers. The ballast tanks can carry the impressive figure of 23,800 tons and are located in both wings and double bottom. To cope with the necessity of discharging ballast as quickly as possible once the loading port has been reached, three electrically-driven pumps are fitted which together expel it at the rate of 2,250 tons per hour, while the last few tons of ballast are stripped out by a stripping pump having a discharge of 150 tons hourly. With such comprehensive shipboard equipment, *Sentinel* certainly represents an outstanding example of her type.

#### The Trade Routes

World-wide prospecting and mining operations in recent years have opened up economic ore deposits in many quarters. The trade routes along which the ore flows in bulk form an intricate network spreading from the mining countries to the principal consumers—the U.S.A., Great Britain, Germany, Japan; from Latin America come 20 million tons of iron ore a year for Europe and for discharge at Baltimore to feed the American industries, and a large proportion of Canada's production from British Columbia on the western seaboard is carried across the Pacific. Recently

Labrador has seen the exploitation of vast deposits at Knob Lake, from whose mines over 12 million tons a year are brought down the 380 mile long Quebec-Labrador North Shore railroad to the loading installations at Sept Iles. Some of this is taken up through the lakes to Contrecoeur, where it is loaded into "lakers" for transport further inland, and some is loaded for the European markets, discharging at Rotterdam which is the great port for the Ruhr and the Continent in general.

The number of metallic ores which have industrial significance is considerable. Iron ores come chiefly from the Lake Superior region in Canada, the Kiruna Gällivare area in Sweden, the Caroni River region in Venezuela and deposits in French Equatorial Africa, Russia and South Africa. Cobalt is found chiefly in the copper mines of Northern Rhodesia and the Belgian Congo, and the principal ore bodies of manganese are to be found in India, Brazil and Ghana. Chromium, nickel, tungsten and molybdenum have fairly widespread occurrence; copper, whose significance appears to be falling slightly as the result of the growing use of synthetic materials, is principally exported by Rhodesia, Canada, Chile and the Belgian Congo, while the chief consumers are at present the U.S.A., the U.K., Germany, Belgium,



France, Italy and Japan. Bauxite, the ore from which aluminium is refined, is widespread but is mined principally in the U.S., Central Europe, Venezuela and Malaya, while new mining projects are in hand in Quebec, French New Guinea and Australia. In general, the chief consumers are naturally those with the highest degree of industrialisation, and a world-wide search is constantly pursued for fresh deposits having a high percentage of metal content to provide for the growing demand.

A typical mine now in operation is the iron ore working of the Orinoco Mining Company, between the Caroni and Orinoco rivers in Venezuela. Iron ore covers the Cerro Bolivar mountain in this sector in a thick layer with practically no overburden, allowing it to be scooped out directly by eight-cubic-yard shovels at a rate of 10 million tons a year. The ore is shipped to Mobile, Middlesborough, Cardiff and the Continent, although Puerto Ordaz, the loading port, does not allow a 47,000 ton deadweight ship to be loaded beyond 23,000 tons because of the depth of the channel—a frequently encountered hindrance at many loading terminals at the present day.

#### A Modern U.K. Handling Plant

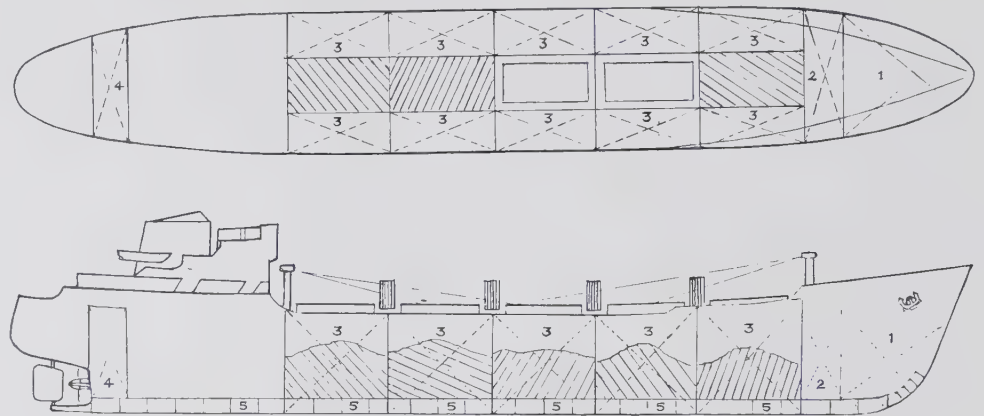
The major proportion of iron ores imported by the U.K. is shipped from Europe and Africa, with about a quarter being supplied by the Americas. It is unloaded at four principal ports—Newport, Cardiff, Birkenhead, and the Tyne, all of which have recently been equipped with modern discharging plant; at Jarrow, for example, the Tyne Improvement Commissioners, in collaboration with the British Transport Commission and the Consett Iron Company, have established a fully mechanised system which, though somewhat smaller than some being prepared for the St. Lawrence seaway system in Canada, provides a fine example of rapid and efficient handling of specialised ships' cargoes.

The Tyne new terminal is established along, and adjacent to, a recently built quay 867 feet long, with a depth of water alongside of 35 feet at low water—sufficiently deep, in fact, to accommodate ships with cargoes of 25,000 tons. Five massive cranes, each with a lifting capacity of ten tons, stand in a row on the quayside, and sheltered conveyor belts carry the ore up to store it in a vast, 90ft. high structure which can accommodate up to 10,000 tons until the special trains running between the terminal and Consett's works 35 miles away have shifted it south to the blast furnaces. The five cranes, working together, can unload 1,500 tons per hour, and the whole cycle of processes has been devised to reduce the necessary labour force and speed up turn-round.

The Master of an incoming ore carrier, therefore, will bring his ship alongside the quay beneath the cranes, and as she is

made fast fore and aft the hatchcovers are winched back to disclose the holds. The grabs drop down into them, with jaws open to their full extent of 19 feet, and as the jaws are drawn together a thin five-ton slice is taken from the top of each pile of cargo; this is then lifted out and run back to a hopper in the crane structure holding 50 tons, which is fitted with a vibrator unit and grids to prevent lumps of ore with a diameter greater than 12 inches from passing through the plant. The hopper does away with the need to slew the crane each time a loaded grab is brought ashore, thus reducing the time cycle to 60 seconds and increasing the output of the crane. From

way up the "cathedral" is a miniature railway—two electrically driven scale cars each equipped with a hopper carrying 28 tons, and fitted with pneumatic rams which open the doors at the bottoms of the main storage bunkers. The scale car driver trundles along the track, 30 feet above the ground, to a preselected bunker, when at the touch of a control handle 28 tons of ore pour into its travelling hopper, to be weighed and recorded. This load is then released into one of the lower subsidiary hoppers—there being 18 sets of two of these, each set positioned above a truck of the freight train waiting directly below—and the process is repeated until all the sub-



*Structurally, the modern ore carrier is an uncomplicated vessel. Note the comparatively small holds necessary for its dense cargo, and the large ballast tanks, shown by broken crossed lines; these comprise (from fore to aft) the fore peak tank (1), the deep tank (2), wing tanks (3) and after peak ballast tank (4). Moreover the deep bottom (5) running beneath the holds only, often contains ballast for trimming in addition to bunkers, lubricating oil and fresh water. The side view shows the hatchcovers in their folded positions, with king posts fore and aft through which their wire warps are led to the operating winches*

the hopper an endless conveyor belt feeds the ore to a longitudinal wharfside conveyor gallery, which carries it to a final, inclined, conveyor gallery running up at right angles to the full height of the main storage structure. The ore is automatically weighed as it passes from the crane.

With each quayside crane lifting out ore at the rate of 300 tons per hour, the time soon comes when the remaining cargo at the bottom of the hold must be shifted from the corners and piled into the centre for the grab to reach it properly. A calf-dozer and an overloader are therefore dropped into the hold with a team of labourers, and the last traces of ore are cleared up for collection by the grab.

The great storage structure, which is over 250 feet long and stands 90 feet high, looks like some vast steel girder cathedral, with its ten enclosed storage bunkers at the top. Each of these bunkers has a capacity of from 700 to 1,270 tons according to the density of the ore, and the whole unit can thus accommodate a maximum of 12,700 tons; its purpose is to allow the discharge of a vessel to carry on without interruption when the speed of this process exceeds that at which the ore is removed by rail. Half

sidary hoppers contain 28 tons of ore each. Only when all eighteen waggons of the train below are exactly positioned beneath the hoppers can they be loaded; at the touch of a switch 504 tons of ore fall into the waiting train, which is then free to steam off to Consett. On an average, 14 trains per day arrive for loading from the iron works, and this effortless handling of the vast quantities of ore necessary to keep the blast furnaces in constant operation calls for a staff of only 20 men. Most of the ores handled here are high-content grades from Labrador, Newfoundland, and Conakry and Bizerta on the coast of Africa.

The ore trade is one which has, admittedly, only in very recent years grown to a size calling for specialised bulk movement facilities; but there is no doubt that over the next quarter century the market will expand in as drastic a fashion as it has done since before the war. With the development of manufacturing industries in as yet undeveloped countries the possibilities seem limitless, and it is only by sea that the necessary ores will reach the ever-growing number of refining plants all over the world.

# THE CANAL AGE

WHEN I began this article, all I knew about canals in England was that they existed (I'd seen some charmingly-decorated barges in Regent's Park) and that their existence was to some people an anachronism and to others a Cause, something requiring special pleading (I'd read about the Kennet and Avon Association conducting a protest paddle to London to demonstrate to British Transport, that their pretty canal was *not* blocked up and therefore unworthy of the Transport Commission's attention).

It turned out to be a story full of surprises. I was astonished to learn that there are 1,400 miles of canals still being used commercially, that in 1956 they carried more than 10 million tons of goods, and that British Waterways are prepared to spend £5½ million on canal development. I was fascinated to read about the period when it all began—when the country roared with laughter at the very idea of canals in England. And then, only thirty years later, how two or three years of canal fever made men gamble in canal shares as recklessly as they did later in gold and oil. The whole canal age lasted for only seventy years and finished after a short struggle when the railways came in the 1830's.

But perhaps the most surprising part of the whole story was the realisation of how profoundly, in those days, a nation's life could be changed by just two men who had vision and imagination, were willing to risk experiments, cared little for fame or money and spent most of their time in hard work. James Brindley, self-taught engineering genius, nearly illiterate, and his eccentric, practical, canal-obsessed patron, the Duke of Bridgewater—Brindley, whose life must have provided almost the first of the American-type success stories of poor boy making good in the industrial pre-dawn, and the Duke, whose contemporaries were not amused by his obvious preference for the company of rough workmen to the elegance of Georgian London—between them they altered the face of the country and the quality of English life. For when they made it possible to transport goods easily and cheaply by canal, the mill wheels began to spin; England was turned from agriculture to machinery, and the Industrial Revolution was born.

In the years before Brindley and the Duke met in 1759, commerce in England was largely local. Small mills of various kinds existed to serve local customers, each community locked away as it were in its own separate compartment by an almost total lack of transport. For the roads of England were then about the worst and muddiest in Europe, unusable the greater part of the year by waggon. Essential

commodities, like coal and wool and salt, were sent by pack train, carried in sacks on horses' or bullocks' backs. Food supplies for the people of London were brought in from the country in panniers. Goods imported into England from the Continent had to be carried inland by pack-horse (or occasionally by waggon) and their inland freight costs were often far higher than the charges for getting them to London from the foreign port.

Manufactured goods which a hundred years later rated as necessities were, in Brindley's youth, utter luxuries and could only be afforded by the rich. And few of these manufactures were produced in England; fine cloth, linen, glass, cutlery, paper and even hats all had to be imported from the Continent. English manufactures were crude, poor in quality and execution—and often more expensive than the imported article.

But small centres of industry were beginning to make themselves felt. Manchester, for example, had doubled its population in a generation; in 1759 it was estimated at 20,000, and most of these people were working at making all sorts of small wares in their own homes—shoelaces, tapes, ticking, and some in weaving coarse wools and fustians. It was all hand-work; the jenny and the steam-engine had not yet come into existence.

The Manchester air was clear, bright and free of smoke, for there were no factory chimneys. Not a single private carriage was kept by a Manchester businessman until 1758. The only coach service to London ran every second day and took four and a half days to make the trip. In winter, when the roads were for the most part closed, conditions were those of a town under seige, for all food supplies came in by pack train and were so expensive that most Mancunians could only afford to tighten their belts and go hungry.

And cold. For, although the mines were only a few miles outside the town, the poor could very seldom afford to pay the high price of fuel. Coals were sold by the horse-load—that is, two baskets weighing 140 lb. each, which was as much as the average horse could carry on its back. The price at the pit-head per horse-load was 10d.; by the time the horse carried the coal into town the cost to the chilly consumer was more than double.

Enter, into this gloomy picture, the young Duke of Bridgewater, through the accident that while his country home was in Buckinghamshire his family coal-mines were near Manchester.

The Duke's life had begun in a manner conventional enough for the day. He was

the fifth and youngest son, but his father and elder brothers sank in rapid succession into their graves, and he succeeded to the title when a pale and sickly twelve-year-old, thought to be slow in the head and weak in the chest like his brothers, and not worth much attention. Stubbornly, almost unnoticed, he stayed alive; at 17, his guardians woke up to his existence and thought it useful to amend for their neglect by sending him off to enjoy himself on the Grand Tour of the pleasures of Italy and France. The Duke enjoyed the tour; but of all the sights, his youthful heart was most moved by the Grand Canal at Languedoc, in the south of France, a canal which had been most fiendishly difficult and interesting to build, and had brought great prosperity to the whole countryside.

Back in London, with an impressively full pocket, he set out to enjoy what was then one of the world's gayest and most entertaining of cities. And, in due course, he fell seriously in love. He proposed and was accepted. But the lady had a frivolous sister about whom there were certain scandals; the Duke asked his love for a promise to break off all contact with her sister, which she refused to do. They quarrelled, and the match was broken off. The Duke, forswearing fashionable life for the rest of his days, and women too, went as far north as seemed practicable—straight to his collieries at Worsley.

His father, before he died, had been thinking about canals, and had even worked out one or two schemes on paper. The young Duke submerged himself in his father's suggestions, and then began immediately to tackle the problem of Worsley—how to get coal out of the mines to Manchester, cheaply. Worsley was near the river Irwell, but the coal had to be carried by horse to the river to be loaded. The Mersey Navigation Company charged a minimum commission of 3/4d. a ton, even for short distances, and even if the coal travelled in the Duke's own boats. River boats were dragged up and down stream by gangs of men, they had to wait for tides and were impeded on smaller rivers by fishing-weirs. The Duke decided to build himself a canal.

He obtained permission from Parliament for a canal which would run first from Worsley eastward to Manchester, and then westward to the Mersey. He knew nothing about engineering; there were in fact few men in the country who did, for the Duke's canal was the first project in England for cutting a navigable trench through dry land and using it for the transport of merchandise, independent of existing rivers. Obviously somebody with ideas was



# THE CANAL



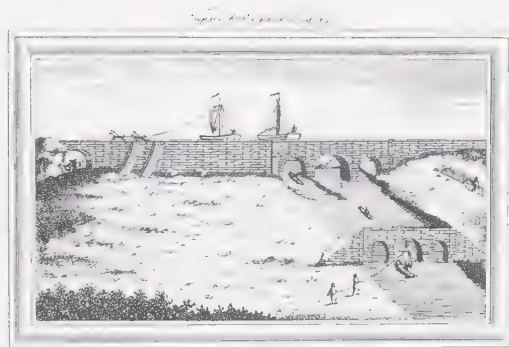
*Stern of a narrow boat on  
the Grand Union Canal*



# AGE



*Pleasure canal boats at Paddington Basin, 1849*



*View of part of the Lakes of Bridgewater's Navigation across the Fox*

*A canal over a canal*



*Worn wooden bollard*



*Drawbridge on the Welsh section, Shropshire Union Canal*



*Iron bollard near Coventry*



*Tillers of two moored boats*



*A lock at Tynley*



*Basingstoke Canal*



*Locking down near Market Drayton*



*White horse's tail hanging from a rudder post*



required. Enter, by virtue of his own extraordinary ability, already well-established, James Brindley. It turned out to be a marriage of true minds.

Brindley, born poor, the son of a shiftless cotter father and a hard-working mother, one of a large family, Brindley who never went to school and began work as a child labourer at anything he could get. His beginning was, for the day, as normal as the Duke's. But his mechanical genius showed itself very soon; when he was still a boy, his favourite amusement was to make models of the various mills around the district, copying in wood from memory all the water-wheels, cog-wheels and other machinery, and setting the finished model to work in a small stream he had diverted for the purpose. He knew what he wanted to be—a mill-wright. At the very first opportunity, when he was seventeen, he apprenticed himself for seven years to a Mr. Bennett, a mill-wright near Macclesfield.

Mill-wrights were, at the time, almost engineers—and almost the only engineers. They were required to have knowledge of the strength and qualities of materials, to handle tools, to invent solutions for emergencies, to understand such machinery as had been invented. To begin as a mill-wright should have been a good beginning.

But for Brindley it began badly; slowly and with difficulty. His master thought him stupid, his mates laughed at his clumsiness. After two years he was told he had learnt nothing; there was talk of dismissing him as hopeless. But he had in actual fact been groping his way to much practical knowledge, and it soon began to show. It was not long before it was plain to his very surprised master that young James was in fact smarter than much more experienced men, and mill-owners in the district began asking for Brindley when it was a matter of new ideas or improvements being wanted, particularly when they involved water-power.

But his greatest triumph as an apprentice was over the machinery of a new paper-mill for which his master Bennett had been hired. The job was frankly beyond Bennett; the machinery, when made, didn't fit and wouldn't work. Over a weekend Brindley, then twenty-one, walked the twenty-five miles to visit the mill on which the new machines had been modelled, spent Sunday in inspection, then walked back to Macclesfield that night with every detail complete in his head, for since he could not at that time write at all he had been unable to make notes. Bennett was only too glad to hand the job over to young Brindley; within a few weeks he had redesigned and remade the machinery. For the rest of his apprenticeship he was in principal charge of the shop, and stayed with Bennett as a journeyman until the old man died.

Then he moved to a new district and set up on his own, without any capital except his skill. The first few years were thin, but gradually business improved and extended,

especially into the nearby Staffordshire pottery district, which was just beginning to feel the galvanising effects of the energies of Josiah Wedgwood.

In the last years of his apprenticeship, he had taught himself to write, at least a little; he never taught himself to spell properly, and his reading remained difficult to the end of his days. He had to rely utterly on memory, and perhaps this was the basis of his genius, for he developed extraordinary powers of concentration. He had an unusual method of work; he would retire to bed for as long as he required to get every detail clear in his mind, and then get up and get things started. When he was asked by the Duke of Bridgwater for a scheme for his canal, Brindley went to the site to have a look (a process he described in his memorandum as an "ochilor (ocular) survey or a ricconitoring"), took to his bed for two day's of solid thought, and then went back to the Duke with complete details.

The Duke's original idea had been to begin the canal inside the mine, bring it out at an open cliff-face, carry it down to the river by a flight of locks, and then up again with more locks, and on to Manchester. This, said Brindley, would be far too expensive. He proposed instead something never attempted in England before—a large aqueduct of stone which would carry the canal *across* the river. The Duke was at once appalled and immensely interested; could they possibly do it? Brindley said yes, experts said no. Brindley was having delusions of grandeur, they said; he had produced the dream of a madman, and a titter of laughter at the Duke's expense went up all over England.

The Duke got an attack of cold feet and called in another engineer to support Brindley. The second engineer took one superior look at the plan and dubbed it a castle in the air. The Duke found his feet warming, perhaps out of sheer contrariness, and he told Brindley to go ahead. Brindley moved into the Hall, where the beds were comfortable and where the Duke was handy for consultation, and the result was the Barton Aqueduct, the sensation of its day.

One of the minor marvels of the aqueduct was the method Brindley devised to keep the water from leaking. This was of course before the use of Portland cement, and wise-acres had predicted that there would be so much leakage that the aqueduct would be useless. Brindley evolved a process called puddling. "Puddle" was formed by a mixture of well-tempered clay and sand, reduced to a semi-fluid state and rendered impervious to water by working and chopping it with spades. It was usually applied in three or more layers to a thickness of about three feet; Brindley's mixture of clay-puddle lasted until the aqueduct was replaced by part of the Manchester Ship Canal in the 1880s, and it made him almost as famous as the Duke's canal.

As the canal grew, it drew out of Brindley's extraordinary mind an endless

supply of original ideas. He took water over hills and through them, he worked out over-all irrigation schemes and laid underground railways in the mine, he invented loading-cranes and he dreamed up water-weights, washing-riddles, raising dams and the first mine ventilation system. If a necessity was unobtainable, he invented a substitute. Normally, while he worked, his manner was calm, concentrated, utterly absorbed. But when he had finished that stupendous brain-child of his, the Duke's canal, the strain showed; on the day they first let the water into the canal he took to his bed, quivering and exhausted with nervous excitement, and he lay there until he heard that everything had gone perfectly.

The first boat-load of coal sailed over the Barton Aqueduct to Manchester on the 17th of July, 1761, and almost immediately the price of coal at Manchester was halved. In the meantime the Duke, flushed with success, had decided to go on a further canal-building spree, this time from Manchester to the Mersey river. This stirred up some very vocal opposition from the Mersey Navigation Company, who had a nice monopoly of expensive river transport between Liverpool and Manchester. Local land-owners were also against him, and the Duke decided to take his engineer to London to help him persuade Parliament of the rightness of his plan. It took them nine weeks of argument; Brindley was several times called before their uninformed Lordships to demonstrate such simple matters as how a canal lock would work, or how to make clay-puddle. Brindley could only marvel at how little men in London knew.

The Duke had paid for the first canal entirely out of his own pocket. The new canal, running from Longford Bridge to the Mersey at Runcorn, was to be even more ambitious; it involved twenty-four miles of canal, plus docks, locks, bridges and everything else, and that one rich young man should even dream of doing this by himself suggests how surprisingly profitable the family coal-mine had been. All the same, it was going to require careful budgeting; the Duke closed down his several other houses, let the servants go, put himself on an allowance of £400 a year, and retired, with Brindley, to a bachelor life in a corner of the Old Hall at Worsley. Even when he had cut his expenses to the bone, money was still short, and there were weeks when he could not meet the Saturday night wages bill. He must have been a much-loved landlord, for when a pay-night crisis arose he used to pass the hat around among his tenants. They were able to carry him for some time; when this situation became desperate once more, part of the canal had just been completed and was beginning to bring in revenue, and on the strength of this the Duke was able to get a big loan from the London banks.

The whole enterprise from Worsley to Runcorn cost the Duke a quarter of a



million pounds, and its revenues made him an extremely rich man, with an income of £80,000 a year. But while it was building, Brindley, appreciating how much the Duke was willing to risk for his dream of canals, never charged him more than the regular rate for a mill-wright's work—three shillings and sixpence a day, for Brindley too was more interested in the job than the money, and although he was offered far more money by other would-be canal owners, he stayed on with the Duke until the job was done. The two of them, holed up together in untidy bachelor comfort at the Hall for weeks at a time, both stubborn and pig-headed, arguing each revolutionary step of the way, must have seemed the oddest possible pair of fanatics. London had washed its hands of the Duke, a rejection that he failed to notice, for his whole attention was taken up by his interest in canals and in his estates. He was one of the largest and most enlightened employers in the neighbourhood. Where other colliery-owners saw and treated their work-people as half-savage, the Duke built his workers a housing estate, with shops and markets, gave the best houses to the steadiest men, organised Sunday schools and weekly contribution to a sick club, and was not in the least surprised that they became models of gentleness and industry.

The Duke's speech was rough, with a countryman's accent, his manner gruff, and his heart full of kindness. He read almost nothing, he would have neither women servants nor flowers in the house, but he had a passionate love for his excellent collection of paintings. He dressed untidily, usually in rough brown wool, and smoked endlessly and grew fat. He was the first great "Manchester man", and more than any other single person he laid the foundations of the prosperity of Manchester and Liverpool.

The second stretch of the Duke's canal was opened in 1767. But long before it was finished, Brindley was also working on a still larger project—a canal to connect the Mersey with the Trent, and both with the Severn, thus uniting the ports of Liverpool, Hull and Bristol. (When Brindley worked on it, it was called the Grand Union; today it is the Trent and Mersey.)

The effects of the first canal, from the Worsley mines to Manchester, had been noted immediately, and by no group more closely than by the Staffordshire potters. The pottery industry was beginning to develop with interesting speed, but—like all other enterprises in England at that time it was greatly hampered by the wretched state of the roads, narrow, miry, deep with ruts, barely possible with waggons in the summer, almost impossible even with pack-trains in the winter. But the raw materials for the potteries had to be brought in from other parts of the country—flints from Kent, clay from Devonshire and Cornwall, all as far as possible by coastal vessel, and then by

pack-horse. Finished articles went out in the same way, first by horse and then by boat. Breakage was heavy, freight charges horrific. The potters, led by Josiah Wedgwood and supported by Lord Gower, the Shropshire coal-owner, decided to invest in a canal of their own.

Josiah Wedgwood might not have been a leader had he not, as a boy, been ill for several years. His family were potters in a very small way, and poor. Unable to continue working as a thrower, young Josiah spent his time in brooding on ways of expanding the family income by improving their product. He had all sorts of ideas about useful and decorative gadgets that could be made out of pottery; they proved popular, and success set in. Josiah's work over the years established a new industry; by the time he was sufficiently rich to become a canal patron, Wedgwoods' were exporting to Russia, to Europe, to America, the West Indies and even to Asia.

So it was a big day in Burslem, the Wedgwood pottery town, the day they cut the first sod for Mr. Wedgwood's canal—the 26th of July, 1766, and the whole district took the day off to celebrate. There were speeches, and a barrel of old Staffordshire ale; Mr. Wedgwood cut the first sod and Brindley, the canal engineer, wheeled it away in a barrow. A sheep was roasted whole for the benefit of the pottery workers, and the master-potters entertained their friends at lunch and dinner. There were bonfires and fireworks and a large party. Then the work began.

It was not without uproar. Gangs of canal navigators ("navvies") moved through the countryside like a conquering army, ignoring game laws, tearing down embankments, making gaps in hedges, damaging fields and woods and drinking savagely in the villages in the evenings. The country people were terrified. Land-owners in general were opposed, for they feared damage to the drainage of their lands. In the early years, before the tow-paths were built, the gangs of men who hauled the barges were uncaring about damaging river-edge property. Mill owners feared loss of water from their mill-streams; the turnpike road interests saw that canals would reduce tolls on roads, while packtrain carriers saw themselves going completely broke. The coastal shipping trade found it easy to estimate how much business they would lose to inland navigation. But the figures in support of canals were unanswerable; one horse could carry 280 lb. on its back; could draw perhaps two tons on a level road, where such existed, but could draw from 50 to a 100 tons on a good waterway. With the Grand Trunk, the canal age was well begun.

It was the largest construction work that had yet been attempted in England. Its whole length was about 140 miles. Brindley laid as much of it on a flat level as possible. (He had a theory about water; if uncontrolled, he said it was like a furious

giant, but "if you lay the giant flat upon his back he loses all his force, and becomes completely passive, whatever his size may be"). There were innumerable locks, several large aqueducts, many minor ones. But the hardest part of the job was the Harecastle tunnel, to be cut through a ridge which they called "the backbone of England", 2,880 yards long, and when Brindley proposed it another roar of amusement went up; it was, they said, completely impossible, a mirage for investors, another of Brindley's mad dreams.

By the end of the first two years' work, 480 yards of the impossible tunnel had been cut and vaulted and 22 miles of the canal entirely completed. The canal work itself was finished on schedule, but the tunnel took nine years more, and before it was done Brindley had died. He was only fifty-five. He had not married until he was fifty—not, like the Duke, because he disliked women, but because he was too busy. When he did marry, his wife was a girl thirty years younger than he was, and convenience of courtship seems to have been the operative factor; she was a land-surveyor's daughter, and her father was working with Brindley on the Grand Trunk canal. She must have been one of the few women Brindley ever had an opportunity to meet more than a few times. He had known her since she was a school-girl. They seem to have been happy together, and she looked after him tenderly when he fell ill, but forty years of neglecting health in favour of hard work, irregular hours and constant exposure to bad weather were too much for him. He became drenched to the skin one day, took a bad chill, and never really recovered.

When he died, he was the acknowledged head of his profession—indeed he had evolved the profession itself. He could still scarcely read, could write only with difficulty, and perhaps his lack of scholarship made even more brilliant the outstanding virtue of his mind: the ability to take an immensely difficult problem and break it down analytically until he could re-assemble it into an apparently simple solution. His method of working out mechanical problems was, even for his less scientific age, quite extraordinary. His brother-in-law described it: "He worked the question for some time in his head, and then put down the result in figures. After this, taking it up again at that stage, he worked it further in his mind for a certain time, and set down the results as before. In the same way he still proceeded, making use of figures only at stated parts of the question. Yet the ultimate result was generally true, though the road he travelled in search of it was unknown to all but himself, and perhaps it would not have been in his power to have shown it to another."

Brindley lived solely for mechanics and

*continued on page 22*



# The right of an airline to choose its own aircraft

BY DAEDALUS

*Should a State-owned airline be allowed to choose its own aircraft without Government interference? Daedalus, an independent aviation writer, examines this question in the light of the situation which arose earlier this year over a new jet for British European Airways. Daedalus is completely free from any editorial direction*

THE controversy over the provision of a new short-range jet airliner for British European Airways earlier this year raised a number of important questions, the answers to which may well have profound implications for the future relationship between the Government and industry, both nationalised and private, in this country. What happened was that the Government, as the source of finance for the nationalised industries as a whole, sought to achieve large-scale amalgamation among important units in an un-nationalised aircraft industry as the price for their being awarded a large contract for new equipment for a nationalised airline. The Government's reasons for doing this were based on its desire to see the maximum financial, technical and production resources concentrated on the project in order to achieve maximum export sales, and also to spread the load as widely as possible as a means of offsetting the detrimental effects upon the aircraft industry of continued cutbacks in defence orders. The fact that the B.E.A. contract would be the last big contract for a new aeroplane the Government would be able to place for some years meant that this was the last opportunity the Government had of enforcing a measure of rationalisation upon the aircraft industry.

The result was that having already chosen the manufacturers and the design which it believed to be best for its purposes, British European Airways found itself involved in what amounted to unnecessary further negotiations with other manufacturers for a design it did not want, simply because its one and only shareholder, the Government, desired to use the placing of the contract as a lever to achieve re-organisation of the aircraft industry. The two major questions posed by this situation are: does any State-owned industry have the fundamental right to choose its own equipment without Government interference; and, does the Government's behaviour in the B.E.A. case imply that in future the provision of new equipment for other nationalised industries, such as the railways or the coal mines, will be equally subject to such extraneous considerations as the welfare of the equipment supplier, regardless of whether that supplier is State-owned or not?

The answer to the first of these questions must surely be that in the private sector of Britain's economy, ordinary commercial considerations customarily apply; any organisation has the right to buy what it wants, where it wants, in order to do the best job it can. The fact that an organisation is State-owned is surely no justification for departing from this procedure. Having been charged by the owners (in B.E.A.'s case the nation, through the Government) with the task of running a business at a profit, the management, Government appointed though it may be, must surely be allowed to get on with it. To ask B.E.A. to recon-

sider its commercial decisions because the Government is perturbed about conditions in another sector of the economy in which B.E.A. has no real justification for meddling, is manifestly absurd.

It is not surprising that B.E.A.'s Chief Executive complained that the airline was in the "very unenviable position" of being able to "make or break" the British aircraft industry. It was a position in which the airline should never have been placed. In private industry, any such attempt by the shareholders to dictate to the Board of Directors would be regarded as a vote of no confidence, and the Board would probably feel obliged to resign. It is astonishing that the Board of B.E.A. did not.

The answer to the second question—what this situation means for the future of other nationalised industries—lies in the basic attitude of any Government towards State-control. In the post-war period Britain has become accustomed to the Socialist belief that nationalisation means Government control for the sake of control, and that it gives the Government *carte blanche* to direct affairs as and how it pleases. One might have expected, however, that a Conservative Administration, the supposed believers in free enterprise, while perhaps finding it politically expedient to accept a measure of nationalisation, would nevertheless leave competent personnel to run the State-owned institutions, while maintaining the right to remove them if they fail to be efficient. This is the same basic principle of shareholder-management relations that applies in private industry, only on the much larger national scale with the taxpayers as the shareholders, exercising their rights through an elected Government instead of through a Board of Directors. On this basis, therefore, B.E.A. should have the inalienable right to take such decisions as it believes to be commercially correct, without Government interference, but with the nation retaining the right to remove the management of B.E.A. if its decisions prove to have been wrong and promise to jeopardise the organisation's efficiency. And this right

of B.E.A. must extend to the choosing of airliners, the very tools of the airline's job. After all, the right of an airline to choose its own aircraft was one of the cardinal principles making for efficiency and profitability upon which the same Government as we have now insisted, when British Overseas Airways Corporation sought to spend on American—as opposed to British—airliners a far greater sum than has been involved in the B.E.A. case. The change in the Government's attitude in the period between the B.O.A.C. and B.E.A. orders was due solely to the deterioration in the British aircraft industry's own situation. But it is not really the prerogative of the Government to settle the future of an un-nationalised British aircraft industry. For most of the post-war period that industry has maintained its prosperity largely on Government contracts for military aircraft. Now that these are coming to an end, the Government can hardly be expected to find alternative work for the affected companies, otherwise it might just as well not try to cut down expenditure in the first place. If the Government feels that politically it is incumbent upon it to help the aircraft industry out of an admittedly dangerous situation, then surely it should seek to achieve the measure of rationalisation it desires *after* the State-owned airline has decided where and what to buy. The inescapable conclusions are that B.E.A.—and any other nationalised organisation—must be allowed to work in the open market, choosing what it thinks is best wherever it thinks it can best get it; and that any bidder for the contracts must see to it for themselves that they are capable of meeting by themselves, without Government aid, the commitments into which they are anxious to enter, no matter where or how far those commitments may carry them. Only if they fail to secure the maximum possible export sales, thereby injuring the overall national economy, can the Government legitimately step in and seek rationalisation as a means of correcting the situation. Until then, any efforts to re-organise or rationalise the aircraft industry must come from the aircraft industry itself.



# GROUP NEWS

## *All-Viscount Services to Africa*

The starting of the new Viscount Safari tourist-class service to West Africa in January meant that all three Safari routes to Africa (West, East and Central) are now operated with Viscounts.

This latest service is operated at the moment once a week and calls at Lisbon, Las Palmas, which is an overnight stop, Bathurst, Freetown and Accra.

It is not surprising that this service is proving very popular. Las Palmas, in the Canary Islands, is one of the most beautiful holiday resorts in the world and the overnight stop there at a luxurious hotel provides a break in the journey which few travellers would wish to miss.

## *Hunting Group activity at Calgary*

As readers will know, aviation and survey activities are not the only Hunting interests in Canada. Huntings, in conjunction with the Guinness Group, entered the Canadian oil industry early in the 1950s, and now handle, through their Gibson companies based at Calgary, Alberta, several thousand barrels of oil daily through the small gathering systems and pipelines built and owned by them.

This Gibson organisation has already proved itself an essential part of the West Canadian oil industry of equal service to the independent producers and refineries as well as to the international oil companies. There is every prospect of considerably broadening these activities in the next few years.

Also with bases at Calgary, are two companies of the Hunting Aviation Group in Canada; Field Aviation Company Ltd. and Hunting Technical and Exploration Services Ltd. (H.T.E.S.). Fields, whose main base is at Oshawa, Ontario are planning a new hangar to fit in with the long-term plans for the development of Calgary Airport; whilst H.T.E.S. provide geological and geophysical services.

## *S.A.A.F contracts for Field Aircraft Services Africa Ltd.*

Fields, who are based at Germiston Airport (Johannesburg), have recently been given the following contracts by the South African Air Force: servicing of Dakota and Ventura aircraft, overhauling of Pratt and Whitney Twin Wasp R.1830-92 aero engines, overhauling of Pratt and Whitney Single Wasp R.1340-AN1 aero engines. The contract is for two years.

## *Bendix Aviation and Fields*

Early this year, the Bendix Aviation Corporation, U.S.A. appointed Field Aircraft Services Ltd. its general sales and servicing representatives in the United Kingdom.

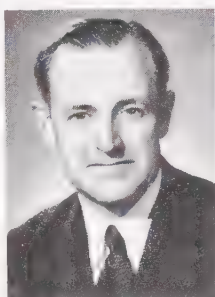
This appointment, made only after a very exhaustive survey of the aircraft and aircraft ancillaries repair and servicing facilities in the



*A corner of the Aerofilms Library, the finest of its kind in Britain*



*En route for Burma, on a Fieldair Ltd. delivery flight of three Hunting Piston Provosts, are Neville Duke, Andrew Bloomer and Ken Burvill. Fieldair, Britain's leading air-ferry specialists have delivered 18 Provosts to Burma alone*



*D. N. Kendall and W. H. Green, heads respectively of Hunting's Canadian aviation and oil interests*

U.K., covers a very wide range of Bendix Aviation products including:

1. Radar and Radio Equipment.
2. Instrumentation.
3. Airframe and Engine Accessories.

Fields will undertake both the sales representation and servicing for Bendix equipment, and their new "Radar and Radio Centre" at London Airport has been completely re-equipped, and is now operational. The Bendix servicing effort is supported by the other Fields' units: the Instrument Section at Bovingdon, the Servicing Division at London Airport, the Engine Division at Croydon, and the Aircraft Division at Nottingham.

The Bendix Aviation Corporation is the world's largest manufacturer of aircraft ancillary equipment and, in fact, is unique in so far as it covers almost every product needed in an aircraft other than the actual airframe and engines.

## *Fine work by the Aircraft Operating Company*

The Aircraft Operating Company (Aerial Surveys) Ltd. of Johannesburg, one of the Hunting Survey Group's companies, recently completed a contract for the Nigerian Railway Corporation involving air survey and ground control for a railway extension, known as the Bornu extension, to Maiduguri in the north-east of Nigeria.

Sir Ralph Emerson, general manager of the Nigerian Railway Corporation, was present at the ceremony of driving in the last peg of the staking of the centre line of the proposed extension, which was performed by the Shehu of Behar.

Before introducing the Shehu, Sir Ralph made a short speech saying, inter alia: "Before asking the Shehu to drive the last peg I would like to express my very great appreciation of the speed and efficiency with which Mr. de la Motte and his team have carried out this work, and to include in that appreciation the very fine and accurate work done by the Aircraft Operating Company of Johannesburg who

*(continued on next page)*



*On the way back to London, by the new London—Accra service, His Excellency the High Commissioner for Ghana in London (and Ambassador to Paris) poses with his staff. On his left stands Hunting-Clan's technical director, Captain Greensted*



produced the maps and ground control from which Messrs. Rendel, Palmer & Tritton were enabled to plan their final location". A.O.C.'s managing director, Mr. Bill Corse, and his men, are to be congratulated.

### *150,000 Aerial views*

Mr. Norman Clark, the manager of Aerofilms Library, 4 Albemarle Street, London, W.1, tells us that he now has over 150,000 aerial photographs in his library. Most of these are oblique or "bird's eye" shots, although there are also a large number of vertical photographs taken by Hunting Aerosurveys in the course of their work.

These photographs cover almost every aspect of the British scene, both industrial and rural. There are views from every English, Scottish, Welsh and Irish county, and a special department is maintained to deal with the needs of schools and education authorities, and for authors of educational books. There is also a worldwide service to universities for examples of the Hunting Survey Group's vertical photography to be used stereoscopically.

Aerofilms, established in 1919, is the oldest firm of aerial photographers in Britain and its library of photographs which dates from that time provides a unique historical record.

The library is not confined to British scenes, but also includes photographs taken by companies of the Hunting Survey Group overseas as well as by many agents from all parts of the world. Although most of the photographs are black and white, an increasing stock of colour transparencies is being built up, both of British and overseas scenes.

### *Hunting Aircraft's interest in the Aircraft Manufacturing Company*

On February 12th, it was announced that the Aircraft Manufacturing Company was to build the D.H.121 for British European Airways, whose Chairman, Lord Douglas of Kirtleside, stated that the B.E.A. requirement would be 24 aircraft and that the total contract value would be £30,000,000 with the inclusion of spares.

Hunting Aircraft has a 22½ per cent. share in the new company and Fairey Aviation 10 per cent. The remainder of the shares are held by de Havillands. Rolls-Royce is fully supporting the project and the engines will be three RB.141s, a by-pass type of jet engine developed from the Conway.

The B.E.A. requirement is for an aircraft to carry 70-80 standard class passengers, or 95-100 passengers in high-density seating, on stage lengths of up to about 1,000 miles. The maximum cruising speed is to be more than 600 m.p.h. The specification will, of course, allow for "stretch" of range and payload to serve a variety of requirements including those of overseas operators. The de Havilland experience gained with the Comet will naturally be of the very greatest value.

Hunting Aircraft and de Havillands are no strangers to one another. The two companies already have an agreement on world sales for the Jet Provost and for many years there has been close co-operation on the famous Piston Provost/Vampire training sequence which has had great success in many parts of the world.

# Hunting Aircraft

BY W. A. SUMMERS, C.B.E., F.R.Ae.S.

IN December 1957 some of the staff of Hunting Aircraft could look back twenty-one years to the days in December 1936 when about 60 people moved from Gravesend with Percival Aircraft to the new location at Luton Airport. We all thought that the new building at Luton, about 60,000 sq. ft. total floor area, was superb after the buildings we had used at Gravesend, but no one imagined the changes which would take place.

The works at Luton is now occupying about 500,000 square feet and employs approximately 2,500 staff. Three subsidiary companies are also controlled by Hunting Aircraft Ltd., namely Hunting Engineering Ltd., the Henderson Safety Tank Co. Ltd., and Hunting Mhoglas Ltd. These companies are engaged on a variety of work, including armament production and development, electronics, special heating elements and components for aircraft and radio trades, which all add to the various interests of the Hunting Group.

As most readers are aware, Hunting Aircraft were the pioneers of jet basic training which has resulted in the Company being awarded a production contract for Jet Provosts for the R.A.F. This aircraft will provide work for a considerable number of the personnel for some time to come, rising to a peak by 1960-61 and gradually reducing over 1962-63.

Aircraft take a long time to design, develop and flight test, then tool for production. The Jet Provost is an interesting case in this respect as will be seen from the following remarks. In 1951 we commenced to think of what the trend would be about 1955-60 for training aircraft. From the information we gained from our close liaison with all branches in the R.A.F. it was decided to proceed with a design study of a jet basic trainer and see what reaction there was. As is now well known, there was a very decided difference of opinion amongst the various branches in the Service and it took a long time to convince the diehards that it would be possible to send raw pupils off in jet aircraft.

Eventually we were encouraged by the Air Ministry and Ministry of Supply with an evaluation order for 10 aircraft which was placed in 1953 to enable the R.A.F. to carry out an intensive series of pupil trials. These trials were started at Hullavington commencing September 1955 and were

completed in November 1957, resulting in a production order being placed with us in August, 1957 for the R.A.F. Since then considerable further development flying has been carried out. Production aircraft have started to come off the production line and will be in service in the Royal Air Force towards the end of the year (also an armed variant for Ceylon). Before the aircraft are in squadron service, over 9,000 hours will have been flown, which should make them comparatively trouble-free for the user.

This brief history of the Jet Provost shows that the aircraft company must always be looking ahead some 7-8 years and, what is more important, be right with its hunches as to what will be wanted. The operator on the civil side and the user on the military side must keep up to date, the one to make a profit and survive and the other to be able to compete with potential enemies and be in a position at the right time to have the necessary superiority both in quality and equipment and trained manpower.

I have tried to indicate in the above, that irrespective of the problems which are with us daily, we must always be anticipating the requirements of the customer 5-7 years ahead.

At the present time this has become more difficult than ever with the repercussions of the Defence White Paper and Government policy on the eventual size and shape of the aircraft industry.

What does this mean to us, one of the relatively smaller units in the industry? Firstly, we are a great deal better off than some much larger units than ourselves, because we have behind us the Hunting Group with their great variety of interests in shipping, oil, survey, aircraft and engine repair, overhaul and aircraft operation. This Group started nearly a hundred years ago with one ship and with the policy of ploughing profits back into the business continually, it will obviously progress and expand further.

The Hunting Aircraft Board of Directors fully realise that they must always study possible projects for the future long before the immediate project has even reached the production stage. 1957 was an eventful year for the whole industry in this country, as with the tendency to inflation it was obvious to everyone that the Government could not afford to spend the money it had



been doing on defence. Hunting Aircraft Ltd. has always had the feeling that it must not have all its eggs in one basket, despite the problems in a company of our size in trying to deal with a variety of projects. This is illustrated by the variants we have been engaged upon over the last 5-6 years; Piston Provosts, armed piston Provosts for small countries who cannot afford a variety of types, communication Princes and Pembroke, Prince anti-submarine and flying classrooms, Pembroke light freighters, Pembroke and Prince survey aircraft and V.I.P. Presidents; also M.T.C.A. Princes and Presidents for calibration of airfield aids. The foregoing is an indication of the Company's desire and ability to meet the demands of as large a variety of customers as possible. In this we can say we have been reasonably successful as 40 to 50 per cent. of our output in recent years has been for over-

trainer and operational aircraft of the next few years and meet the continuing need for up-to-date training.

With regard to the civil field, we have carried out some extensive research into what is required, but whatever is done will have to be as a private venture, for the Government tell us quite clearly that the industry must finance itself and reduce to three or four groups. We, ourselves, have had an idea for a long time that a twin turbo jet aircraft of 40 seats with a range of 600-800 miles should be a good proposition. An extensive design study was carried out resulting in the P.107. This design has been modified considerably from our first thoughts. A new aircraft of this kind costing something near a quarter of a million pounds sterling fully equipped, needs finance to the tune of between £4 million and £5 million to design, test, prove, tool for production and finance the initial

new B.E.A. aircraft, the D.H.121. We all feel we can work together on a joint venture without being completely eclipsed and losing our identities, and make a success of this and other aircraft in the future. We will have to sort ourselves out over the next few years and this experiment in joining up with other companies will progress, I feel sure, to our mutual benefit. All our joint efforts I feel confident will meet with success as we are fully assured of each other's ability, and there is a feeling at all levels in each Company that we have to make the consortium a real success irrespective of the difficulties which may arise.

In addition, we have a great advantage over a complete amalgamation at this stage in that we have three complete design units, all of which have been successful in their own spheres. Each team is capable of bringing out another new project



seas customers including Sweden, Belgium, Western Germany, Iraq, Burma, Rhodesia, Tanganyika, Finland and Eire, to name only a few.

Now to look at the future; what do we see? A rapidly growing requirement for civil aircraft due to the increase in both passenger and freight traffic which will undoubtedly go on for some years. At the same time a reduction in military aircraft due to a number of things, but mainly the Defence White Paper, the cost and complexity. First of all, on the military side, our field has always been in the training aircraft. Can we expect another trainer requirement after the Jet Provost for at least 7 or 8 years? I would think this is extremely unlikely as we are told that the P.1 is to be the last manned fighter, although it seems fairly certain that several types of manned aircraft will still be in service for at least ten years from now, but obviously in reducing quantities. Our idea, therefore, must be to develop the Jet Provost as far as possible to line up with any probable alterations to the advance

production before the deliveries can begin. About 90 aircraft must be sold before making a small profit and recovery of development costs. This can only be done by possibly two or three companies getting together and making it a joint venture, spreading the risks and liabilities. This project and other civil possibilities are still being closely studied before committing ourselves to the definite spending of vast sums of money. Government policy, therefore, seems right on the surface for consortiums, amalgamations, etc. Every company, however, wishes to retain its own identity and does not want to be taken over by someone else.

The answer appears to be obvious. Companies who have shown their ability to work together in the past can work together jointly on new projects in the future. They can, therefore, and will, I think, have to get together and try out the new theory of integration or consortiums on new projects. This is being tried out in what we think is the ideal way with de Havillands, Faireys and Huntings on the

in which we could all participate, and we all have other projects in the production and development stages.

Summing up, we shall ensure work for the majority of our staffs for a long time to come, and can look with some confidence up to the middle 1960s, and possibly later, by being a partner with our good friends de Havillands and Faireys in the new Company, the Aircraft Manufacturing Company Limited. Besides being responsible for important components of the D.H.121, we have an arrangement that we will offer any work on other aircraft to each other before sub-contracting outside the Company. The closest co-operation is illustrated by the various teams which have been set up comprising the experts in each company working jointly together on the important aspects of design, production, sales and export, and overall finance and administration. In addition, we are situated ideally geographically, being within about half an hour by road from each other, which will certainly lower transport and other costs.



# Family



# Album

## F. W. Buglass

Frederick William Buglass, works director of Hunting Aircraft Limited, was born in March 1905. Educated at Rosyth, Scotland, he entered H.M. Dockyard as an apprentice and completed the four years in the Upper School.



F. W. Buglass

His education in electrical and radio engineering was completed at Heriot-Watt College, Edinburgh.

Rosyth dockyard and shipbuilding appearing to have no immediate future, he turned to aircraft, joining Boulton & Paul, Norwich at the end of 1924 as a draughtsman and stressman.

In 1928 Buglass moved to Blackburn Aircraft, originally as a draughtsman, afterwards becoming section leader, but forsaking the drawing office for the works in 1933 to act as technical liaison with the works. After a period in charge of Experimental Planning he became chief planning engineer (production). Finally in 1937 he was appointed chief production engineer.

In 1945, at the conclusion of the war, he rejoined Boulton Pauls at Wolverhampton as production manager, holding this post until May 1953 when he was appointed works manager at Percival Aircraft Limited. In February, 1954, he became works director.

Away from the office, in his Hemel Hempstead home, Buglass finds relaxation in natural history, collecting and cultivating alpine plants and colour photography, subjects in which his wife is also keenly interested.

\* \* \*



Evelyn Cochrane

## Miss Evelyn Cochrane

Evelyn Cochrane, head of the estimating department at the Hunting Survey Group's British headquarters, was born at Barnton, near Edinburgh, where she was educated privately before going to Edinburgh Ladies College. Subsequently she moved to London and ran the advertising for a textile firm for several years. Extremely interested in photography, she joined the famous St. Bride's Photographic Society.

As with so many, it took the war to give Miss Cochrane full scope for her exceptional talents. She had joined the A.T.S. after Munich and was soon called up to become an ack-ack instructor, giving lectures to the A.T.S. and War Gunnery Courses on subjects associated with survey, photography and gunnery.

She was later seconded to the Ministry of Supply Experimental Establishment at Aberporth to carry out work on external ballistics of rockets. As an assistant superintendent of

experiments, she was present at the first guided missile trials.

Miss Cochrane joined Huntings' Elstree organisation in 1946 and with her obvious ability was soon put onto the vital work of estimating. Now she runs the department and owns the biggest slide-rule in the laboratories, which is saying a good deal!

Undoubtedly Evelyn Cochrane is an outstanding example of a woman who can retain her charm even in the most hectic moments of commercial life. What a waste of talent it would have been, if she had lived in mid-Victorian times!

We must not finish without mentioning her golfing prowess. No Group meeting is the same without her and, whatever the conditions, she slams the ball right up the fairway.

\* \* \*



L. B. Pares

## L. B. Pares

L. B. (Lou) Pares, of the Adastra Survey Group in Australia, was born in Mareeba, North Queensland, but moved to Sydney at a very early age, where he was educated at North Sydney Boys High School, and where he has lived ever since—on Sydney's North Shore.

Pares joined Adastra Airways Pty. Ltd. in 1940 as accountant to the company, but was not there long before he joined the Artillery, in which he served for four years gaining considerable experience, practical and otherwise, in survey work.

Peacetime found him back with Adastra where he was given the opportunity of controlling the aerial survey operations. In 1953 he was appointed assistant general manager and, shortly afterwards, secretary to the company. More duties fell on his shoulders with the formation of Adastra Hunting Geophysics Ltd. two years later, as he was made general manager and secretary of this company in addition; and it is a company, too, which has made enormous strides in its short existence.

Like most Australians, Pares is keen on sport and, also like most Australians, he has a natural aptitude for it. Cricket and tennis were his first loves, but now he has turned to golf.

His elder son, Geoffrey, has above average tennis ability even in a country where the Davis Cup has become almost a permanent possession, and has won five state junior titles. Aged 16, he will soon be off to University where he will take Arts. Younger son, Kenneth, is also scholastically inclined.

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ALMOST any London landlady will say at once that she far prefers young gentlemen tenants to young ladies. The helpless dependent male, striving with tin opener and darning needle appeals to her maternal instincts. Young ladies, on the other hand, are as restless and unreliable as magnetic helicopters. Their telephones and door bells ring incessantly and often at awkward moments like the middle of the night. Girls seem incapable of remembering such things as keys when they go out and their young men's cars are all so antiquated, that the precious television threatens to blow up at least once every evening. Admittedly, if the landlady is of a curious nature, which is after all an essential in landladying, then she is fed with tempting food for gossip and speculation.

When she calls for the rent, to her beady and glittering eye all the chairs seem heaped with clothes; there is spilt powder on the floor and unstopped scent bottles and, horror above horrors, beer rings on her favourite inlaid table. The girls themselves often seem quite unbalanced. Once or twice she has caught them dancing dreamily with the cushions and, no sooner have they come in, than they are dashing out—all dressed up. "Don't know how they do it", the landlady remarks to her friend, "they never seem to eat or go to bed—I can't think what their mothers would say!"

She would be glad to know that her comments are usually echoed by the loving parents of the bachelor daughter, when she goes home at the weekends with black lines under her eyes and slightly grey in the face. She usually proceeds to sleep like a log, or wander about in a dream, finding it difficult to show much interest in the rockery or enthusiasm for the Women's Institute fete. She appears to her father to wear too much make-up and to her mother too young to wear black. And on Sunday night she departs again from her comfortable protective home, plus half the larder, and stiff reminders to eat breakfast and *not* try and burn the candle at both ends.

Most parents find great difficulty at first in understanding why their cherished daughters so crave to leave comfort for small cold flats, often furnished in ghastly

## Girls on their own BY JENEFER MILLS



*'is fed with tempting food for gossip . . .'*

taste, or the even worse tiny, dingy bed-sitting rooms. The fact is, that it is not the place which counts, it is freedom that really matters and it quite blinds the young to their surroundings. To lead full and interesting lives these days, girls must work and, when they feel that they can hold a job, they think quite rightly that the fullness of independence is theirs. So daughter after daughter, sometimes in the teeth of family opposition, liberates herself and joins the throng of "bachelor" girls stretching their wings and purse strings all over London.

It is quite something to find that £7 10s. a week, plus what little Daddy is kind enough to give one, won't buy nylons, gin and groceries. That is why the experience is so excellent. Gone is the day of the "futile little woman" wringing her hands and appealing to men because of her helplessness—girls these days must learn at an early age to stand on their own feet. The art of living well on very little money is something which can only be learnt the hard way and girls probably enjoy themselves just as much as the lucky one who marries a millionaire. There is no doubt about it, this is the age of the four-handed, miracle woman—there are not many idle rich in England, and young wives have to have jobs. But when work is finished, husbands do not hold with exhausted women—oh no, they must cook, look elegant, entertain and be as gay as if they had spent the whole day just arranging flowers and having their hair done! The best and only school for this sort of woman is the bachelor girl's flat.

The difference in girls' flats is marked and amazing. There are in fact far fewer dens of disordered sordidity and vice than is supposed and condemned; girls, after all, are still their mothers' daughters, and house-proud. Even if humble, with the aid of cushions, lights and rugs pinched from home, paintings done by talented friends, attractive ash trays and candles, the most dreary, soul-destroying flat can be converted into a cosy home of which the inmates are enormously proud. There, girls can experiment with mobiles, sack dresses and tomato walls, without upsetting mothers and having their fathers fighting for breath and threatening a stroke. Some of these flats are absolutely charming—and without a lot of money spent on them.

The best idea when leading this sort of life is to rent a furnished flat; this cuts the cost and gives more scope. I, for example, share with three others. We pay a rent of £2 10s. a head, which means we can stand a full rent of £10 a week with something left in our pay packets, and have a reasonably big flat. The one with the best head for figures has the job of winking the rent from the rest of us and handing it over to the landlady. Even a rent of this size, which is average, hoovers quite a hole in one's meagre earnings, so it is inevitable that bachelor girls tend to live very much from hand to mouth.

What a divine thing it is to come back after perhaps an unrewarding and exhausting day behind the typewriter—and do as you like! Mr. Wonderful may telephone, a party may materialise out of thin air—life



*'paintings done by talented friends . . .'*



is full of social speculations—and, even if not, a boiled egg in bedsocks while listening to Verdi's Requiem and comparing the day's gossip is not too bad a fate. There might come, and sometimes does, an invitation to end all invitations. At such a time, the telephone is the bachelor girl's best friend and life without it would be like a flat in outer space—but it's stiff upper lips and work in coffee bars when the bill comes in.

With four girls living together, provided they get on well, how could life fail to be full of intrigue and excitement? What heaven to stay in bed ALL day on Sunday just because one wants to! To have breakfast the night before to save time in the morning, because it suits one better—I can



*'beware of these baited culinary traps'*

and bang on the ceiling—don't they know that sharing a flat is the greatest fun? What if each morning getting up becomes a more arduous and ghastly experience than the morning before—absolute silence, no breakfast and a hand gallop to the bus or tube? True, life could be organised better, but those days can come with the responsibilities of husbands and children.

The way to a man's heart is through his stomach, particularly if he is also living in a flat and doing his own cooking, and since every bachelor girl feels that perhaps tomorrow she will meet a Prince Charming, every "possibility" has to be invited to dine. Beware, oh man, of these baited culinary traps! There is nothing that welds females



*'what heaven to stay in bed . . .'*

think of countless deplorable, delicious habits in this vein! How much better is a mutual wardrobe of hats, earrings, scarves, belts and anything else that fits more than one member of the menage—the evening coat that is worn by each in turn and is somehow never recognised. Then there's the cooking and great inventions and excitements; the cleaning and not much enthusiasm! There's each others' lives and tales of work, so that one knows the others' bosses almost as well as one's own. One is constantly cramming twenty-five hours into twenty-four and feeling permanently exhausted, but life is too short to worry—one must make the best of being young and strong and enthusiastic. What if the neighbours do complain of the noise



*'Old cosy, the most vital asset'*

together so firmly as the capture of the male—unless of course there is only one hunted and two hunters under the same roof! As the earning capacity up to the age of thirty is roughly the same, whether male or female, it is not surprising that the modern girl tends to do her share of the courting.

The most vital asset to any female establishment—after the gramophone and the telephone—is the "old Cosy". He is a man whom everyone knows and treats like a brother, and confides in like a sister, but he never figures in a romantic light. He is presentable, likeable and can be asked to make up numbers on any occasion, take girls to duty dances that their mothers have insisted on; can be called upon to mend



*'clever play with aprons'*

the door bell, a broken chair or the gramophone and, best of all, he will take all four girls to the cinema without turning a hair. He is happy to sit on the floor and eat eggs, and he always turns up with a smile on his face—dear Cosy—the comfort of the female flat!

The marriage bug can sweep through a flat like Asian 'flu. Once one girl gets an engagement ring, the others look sadly at their ringless hands and start putting the screws on their unfortunate possibilities with subtle hints, clever play with aprons, candlelight and sentimental records. Girls seldom share a flat for long because the Wedding March suddenly seems their favourite tune, and their long suffering parents sigh with relief.

## THE CANAL AGE—continued from p.15

engineering; he hardly noticed any other aspect of life. Amusement of any kind bored him, and he had little general conversation. But he commanded outstanding respect throughout the country from those who knew him and his work, perhaps all the more because, in that corrupt and cynical age, his integrity was inflexible. He was himself modest, of simple tastes, and probably

his greatest pleasure was to help other engineers with the solution of the new problems that faced them with developing industry.

His own output was formidable. When he died, he was working on a number of other canals as well as the Grand Trunk, all of which had to be finished by others, but he himself planned and built some 360 miles of canals and all their attendant locks, bridges and tunnels. Yet only the most imaginative commercial minds of his

day—and Josiah Wedgwood more than any other—seem to have realised just what Brindley was doing to English life. Even the observant Dr. Johnson failed to notice the changes that canals made; he never mentioned Brindley's canals, though they were all completed in his lifetime.

In fact appreciation did not mount first into consideration and then into mania until 1790, when there came two wild years of canal fever and speculation when every



# HUNTING GROUP REVIEW

SHIPPING · OIL · AVIATION · SURVEY · Number Two 1958

## Editorial . . .

### Around the World

THE important Hunting Aerosurveys contract, to which the Aircraft Operating Company has contributed aircraft and crew, in connection with highway development in Ethiopia highlights once again the astonishing variety and wide-flung activity of our survey group of companies. Throughout Africa teams from all three types of survey company—aerial, airborne geophysical and ground resources—have been very busy in recent months. But Africa is not exceptional. All over the free world, teams of surveyors and scientists are helping to map and plan for the vital work of economic development.

### An Unnecessary Difference

It is Christmas Eve. The express rattles through the countryside carrying excited workers back to their homes for the holidays. There is Miss Smith contented and happy in her reserved corner seat reading the book she is giving her father the next day. Outside in the corridor, Miss Brown is bumped and jostled by the endless queue of people passing up and down. Enviously she peers through the compartment window at lucky Miss Smith.

But why couldn't Miss Brown have reserved a seat as well? Because her firm didn't announce the length of the Christmas break until about three days before, whereas Miss Smith's had done so early in November. An unimportant detail? Not at all! It is just these little things which make all the difference to employees. So managing directors and company secretaries please make a note to announce all holiday break times at least a month beforehand, and then stick to them rigidly.

man dreamed of digging a ditch—or at least of floating a company to finance it—that would lead him on to fortune.

And by 1840 it was all over. Canals were dead, people said; railways were the thing. Canalmen did not give up without a fight; there was a fascinating period in the history of transport when the canals competed successfully against the railways for passengers. Between Edinburgh and Glasgow, for example, there were excellent "swift"

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### The World is their Field

What a heartening sight it is, to take a walk round the Field hangars at London Airport and to savour the international flavour of the airliners in for servicing. These include the Constellations and D.C.6s of Flying Tigers; the Viscounts of Middle East Airlines; A.U.A. (Austria); Icelandair; and Iraqi airlines; the D.C.4s of Icelandic; Wheeler Airlines and Overseas National. It shows the ever-growing reputation of Field's workmanship.

### Going Up?

Most companies acknowledge nowadays that promotions should be made within the business. To put it mildly, a deputy works manager isn't going to turn cart-wheels to find that when his boss is knocked over by a bus, a new man is brought in.

Of course, there are a lot of snags to this and there will be many quite justifiable exceptions, but as a general principle, this is the right line to follow. It is not, however, a particularly easy line always to adhere to, the main problem being how narrow to make the ladder. Are promotions going to be made within the department where the

vacancy occurs or is everyone in the company to be considered? Then, there is the even more difficult problem of what to do when the obvious candidate is not young.

### Did You Like It?

Readers may sometimes wonder why we feature subjects, such as "The Canal Age", nothing to do with the Group. James Brindley was a great man by any standards but he is also a comparatively unknown one. We publish his story, therefore, simply because we think that readers will be interested, and that they may not know of his astonishing career. It is brilliantly told by Marjory Whitelaw.

### A Well-Deserved Honour

Everyone in the Group, and many outside it, will be pleased that Hunting Aircraft's managing director, Arthur Summers, has been awarded the C.B.E. Although Mr. Summers would be the first to disclaim it, he more than anyone else should take the credit for the success of the Jet Provost and the Pembroke.

were about 4,250 miles of canals and canalised rivers in Great Britain. Canals paid anywhere from 25 to 75 per cent. in dividends, carried by far the greater part of the country's trade, and provided the means by which the Industrial Revolution had taken place: cheap coal, cheap transport, cheap freight . . .

And behind it—just those two surprising men, James Brindley and the Duke of Bridgewater.







AR28

# Hunting Group Review

SHIPPING · OIL · AVIATION · SURVEY

NUMBER ONE · 19





# Hunting Group Review

NUMBER ONE - 1961

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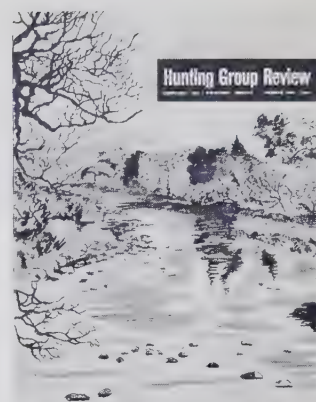
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*For our cover we travel up the Tyne, home of the Hunting Group, into the Northumbrian hills. It is here that the river is at its loveliest, running deep in the valley floor and so clear that one can see a sixpence in five feet of water. The artist is Wendy Butler of the 'Review' staff.*



SHIPPING

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# Editorial

THE NEWS that Sir Percy Hunting is retiring from the Chairmanship of the Group and that his brother, Mr. Lindsay Hunting, is succeeding him with Sir Percy's son, Mr. Pat Hunting, becoming vice-Chairman, will be known already to most of our readers. An appreciation of Sir Percy by Mr. Cook, the financial adviser to the Group, is on page four.

The fact that Sir Percy is retiring from the chairmanship does not mean, of course, that he is retiring altogether. He is retaining some of his directorships and will be travelling extensively. He will also be interesting himself in several special projects, and we realize, too, that he will still let us know if he thinks the *Review* is below standard!



THIS EDITORIAL PAGE of the *Review* is also the appropriate place to congratulate Mr. J. L. Smith on assuming executive control of the new Hunting light engineering group; Mr. E. J. D. Pritchard on becoming Managing Director of Aircraft Operating Co. (Aerial Surveys) Ltd. and Field Aircraft Services Africa Ltd.; and Mr. R. E. Treacher on being appointed Assistant Group Financial Director.



SOMETIMES on this editorial page, we digress right away from the world of business and industry. The other day we were re-reading 'The Old Curiosity Shop', and were struck once again by the wonderfully brilliant word picture which Dickens had the power to evoke. Who amongst the writers of today could describe day-break in London with the same beauty?

'The town was glad with morning light;

places that had shown ugly and distrustful all night long, now wore a smile; and sparkling sunbeams dancing on chamber windows, and twinkling through blind and curtain before sleepers' eyes, shed light even into dreams, and chased away the shadows of the night. Birds in hot rooms, covered up close and dark, felt it was morning, and chafed and grew restless in their little cells; bright-eyed mice crept back to their tiny homes and nestled timidly together; the sleek house-cat, forgetful of her prey, sat winking at the rays of sun starting through keyhole and cranny in the door, and longed for her stealthy run and warm sleek bask outside. The nobler beasts confined in dens, stood motionless behind their bars, and gazed on fluttering boughs, and sunshine peeping through some little window, with eyes in which old forests gleamed – then trod impatiently the track their prisoned feet had worn – and stopped and gazed again. Men in their dungeons stretched their cramp cold limbs and cursed the stone that no bright sun could warm. The flowers that sleep by night, opened their gentle eyes and turned them to the day. The light, creation's mind, was everywhere, and all things owned its power.

'The two pilgrims, often pressing each other's hands, or exchanging a smile or cheerful look, pursued their way in silence. Bright and happy as it was, there was something solemn in the long, deserted streets, from which, like bodies without souls, all habitual character and expression had departed, leaving but one dead uniform repose, that made them all alike. All was so still at that early hour, that the few pale people whom they met seemed as much unsuited to the scene, as the sickly lamp, which had been here and there left burning, was powerless and faint in the full glory of the sun'.



WHEN THE groundhog disappears from the rural scene in Ontario, it means that winter has set in. There's a legend that he reappears on the second of February and that if he then sees his own shadow there will be six more weeks of winter.

This isn't exactly true, of course, because groundhogs often leave their winter quarters, have a stroll round, and then disappear again. At the end of the summer this remarkable animal eats and eats and eats, until he is four times his natural size; he then curls himself into a ball, lowers his body temperature to just above zero and his heartbeat to eight or nine a minute, and goes into a deep sleep. There is a mysterious mechanism, known only to the groundhog, by which he wakes himself if he is in danger of freezing. This probably gives rise to the legend, since it is then that he walks around to warm himself up before going back to sleep.



THE DIRECT mailing list of the *Review* is to be revised, and if, as a consequence, any reader finds himself not getting future issues, although he would still like to be on the list, would he please let us know?



WHEN Miss Butler of the *Review* staff asked the Editor and the Art Editor if she could design a cover, those two old fogies were both rather doubtful, but they now hope that you will agree that they were both wrong. Youth and enthusiasm will always triumph.



# Sir Percy Hunting

*An appreciation by R. R. S. Cook*

As reported elsewhere in this issue, Sir Percy Hunting retired from the Chairmanship of the Hunting Group at the beginning of the year. Mr. Cook, the Financial Adviser to the Group, has known him for over thirty years and is, therefore, particularly well qualified to write this appreciation.



*As a Royal Flying Corps officer in the First World War*

THE TASK OF WRITING this appreciation is approached with great pleasure, but also with considerable trepidation; pleasure for many reasons but particularly because it affords the opportunity of expressing a view long held that Sir Percy has not always been fully or properly appreciated in many quarters; and trepidation because of the writer's doubts as to his ability to do justice to the occasion. How can one do justice to Sir Percy – his foresight, his hunches and his ideas which have left us all hanging on to his coat tails?

Much has been said over the past years about the Hunting Group and its achievements. Surely, what should be said about our former Chairman is virtually synonymous. The Group's achievements are his achievements. He has been the one who has built up, led and inspired a number of teams which have successfully developed the various activities within our Group.

In 1954, Sir Percy wrote an article for the *Group Review* entitled 'How it all Began'. The shipping business, the origin of the Group, and which was started by his grandfather, Charles Hunting, was continued by his father, Charles Samuel, and, in due course, Percy Llewellyn appeared on the scene, followed by his brother, Gerald Lindsay.

Readers of the article may remember that it showed both grandfather and father had the same urge to develop other interests as Sir Percy had shewn.

'How it all Began' was mainly concerned with the era of grandfather and father and deals but briefly with later periods under Sir Percy's leadership. This appreciation carries on the saga to the present time, although many of the earlier events of importance are almost legendary and clouded in vague memories; even to one who has had over thirty years' experience

with Sir Percy and the Hunting Group.

He was born in 1885 and educated at Loretto. Before coming into business, he served his time as a marine engineer, both at Technical College, and subsequently more practically in a North East coast marine engine builders' yard. His business career, therefore, had barely started when the 1914 war broke out. He himself has stated that his sole contribution in those early years was the introduction of the first lady member of the staff, Miss Shawyer, on 1 January 1912, a step horrifying and revolutionary to the traditional atmosphere of a shipping office – as usual his thinking was ahead of others. Whether or not he was a supporter of Mrs. Sylvia Pankhurst and her suffragette movement is not known, but at least a clue is afforded to what happened so many times in later years when in turn he has horrified Managing Directors of our various companies by insisting on the employment and training of women as an answer to labour shortage problems. Cochran's Beauties pale into insignificance beside the Hunting Beauty Chorus!

In World War No. I both Sir Percy and his brother served first in the infantry and then in the Royal Flying Corps. It was then, in 1915, that their first interest in aviation started and it was decided to go into commercial aviation if the opportunity was seen. Actually, it was some twenty years later before the first minor steps were taken to implement this decision in the form of an investment in two small companies – an aerial survey company and an aircraft repair and maintenance company.

Enormous losses by enemy action made it necessary to plan a new ship building programme following the end of the war in 1918. This took considerable time, and heavy inflation resulted in vessels costing

far more than anticipated – while, before they were completed, it became necessary to postpone delivery of vessels due to a slump in tanker freights and inability to obtain employment. The first new ship was not delivered until May 1923. In the meantime, Mr. Charles Samuel Hunting had died in September 1921 so that right at the beginning of his Chairmanship Sir Percy was faced with his first group ‘headache’. This could have been a major setback as the new vessels cost more than twice their replacement value a few years later. The slump, however, was weathered, and courage and foresight in planning resulted in further new vessels being ordered and ready for delivery in 1925 and 1926. The build up was under way and in 1928 two further tankers were added to the fleet, one, the *Gretafield*, 14,800 tons deadweight, being for those days the equivalent of a large supertanker of today.

It took some years to absorb this build

up with one or two tanker depressions to overcome in the meantime, and it was nine years later before orders for the next three tankers were placed. During this period, in 1933, Sir Percy had moved to the South of England and had devoted his intense personal interest to the development of E. A. Gibson & Co. Ltd., which was the fundamental cause of that company’s expansion. Also during this period he played a large part as Vice Chairman of the International Tanker Pool in forming and running the very successful tanker pool that operated in the middle thirties as a means of combatting the slump.

At this time many other activities were having the Chairman’s energies devoted to them. One that comes to mind was the task of trying to put the firm of Dixon Corbett Ltd., rope manufacturers, back on their feet after that company had run into severe difficulties. Huntings had a considerable investment in this company, and Sir Percy was a director. He took the lead in appointing a new chairman and manager and bore the brunt of a fight that was waging between rival shareholding factions due to the perilous state of the Company.

Another of Sir Percy’s earlier diversifications from shipping took place in the early thirties when he spent considerable time acquiring concessions in the Mosul Oilfields which, through inability to provide the large capital for development, were subsequently transferred to the major oil companies.

A descent on Texas and Oklahoma should be mentioned. This resulted in the acquisition of extensive oil leases and royalties now owned by the Group companies, Sylva Oil Company, and Brazos Young Corporation.

This recalls an earlier but less successful venture, considerably before the writer’s time, evidenced by a large wad of debenture certificates in a concern called National Fuel Oil. These certificates occupied the greater part of a small safe in the Newcastle Office and for many years were zealously checked by auditors to verify an investment long since written down to a nominal value of £1. It was always a great temptation to have the walls papered with them. These were acquired when the young Mr. Percy Hunting was, it is suspected, sowing his wild oats.

It was at this time that there arose in a minor way the custom of sending back to base for funds for this, that or the other hush-hush investment or requirement. This was subsequently to become a well known procedure resulting at one period in so many Suspense Accounts in our books that we completely baffled our auditors who occasionally had great difficulty in convincing themselves that they could safely give their usual certificate of solvency. Current procedure is more modern, al-



*A recent picture of Sir Percy at his desk*

though as yet we have not descended to staging bank hold ups.

Before the Second World War Sir Percy was Chairman of the Tramp Tanker Section of the Chamber of Shipping, but the functions of this section were too limited for him, and he turned his attention to the possibilities of forming a live Independent Tanker Association. However, at that particular time, the threat of war made it necessary for preparations to be made for the operations of tankers on war time requisition, and with this in view Sir Percy formed a working party of a number of independent tanker owners, together with representatives of Shell and British Tankers. This committee met continuously and actively in his London Office for some twelve to eighteen months and prepared a draft form of Blue Book rate charter party ready for when war was declared. This was subsequently the basis on which tanker owners negotiated their war time charter arrangements with the Government and Sir Percy’s Committee, with others added, became the Chamber of Shipping Committee for handling these negotiations. By that time, however, he had passed on his work on this committee to the writer as he, himself, was occupied in a drive to obtain production of aircraft on sub-contract manufacturing operations, this being his latest activity as a war-time effort.

It was from this small beginning on aircraft sub-contract work that Sir Percy developed his interest in aircraft manufacture which continued after the war and finally resulted in producing the present position of Hunting Aircraft Ltd., now forming part of British Aircraft Corporation Ltd.

So far the period over which most people have known Sir Percy best has only just



*TOP: Sir Percy has always been an excellent speaker and here he is seen at the Group Lunch last November. On his left is the Commodore of the fleet, Captain R. F. Murray, and, on his right, Drs. R. Van Eyle, the guest speaker*

*LOWER: Sir Percy with his brother, Mr. Lindsay – one would like to have known the joke! The vacant chair between them belongs to the speaker at a session of a Hunting Survey group conference some seven years ago*



been approached in a reference to minor investments in air survey and aircraft repair and a small beginning on aircraft manufacture in the form of war time sub-contract work.

In the Second World War Sir Percy suffered grievous losses, a personal one in the death of his younger son Lt. R. A. Hunting, R.N., who was killed in H.M.S. *Repulse* in 1941, and a business one in the almost complete destruction of the Hunting Fleet once again. In the middle of 1941 we were left with one whole tanker and the engines of another, the stern half of a vessel having been salvaged. By the end of 1941 decisions to start a replacement programme had already been made. Sir Percy had first to overcome memories of the

vessels could be obtained. Two new vessels were ordered in 1942 for delivery in 1943 following a fight to obtain licences and berths. Slightly later we contracted to buy three war-built tankers from the Government for delivery after the end of the war and two T.2 tankers from the United States authorities.

The above provided a stop gap fleet until the opportunity to build to our own requirements came a few years later.

It was round 1949 before it was possible to get down to ordering the replacement fleet we desired. This, however, finally resulted in the construction and delivery of nine new tankers between 1951 and 1953, and in recent years five further new vessels have been added to the fleet.

*Sir Percy laying the foundation stone for the church of St. Francis at Luton, built for a new housing estate, in the early months of last year*



rather disastrous position that arose in connection with the replacement programme following losses in the 1914 war. However, he quickly recognized the probability of a somewhat different situation and the need to be early in the field with replacements.

The decision to be met was one of taking what vessels we could get rather than build what we should like. Licences to build were restricted and only war time standard

Behind this build up was the foresight and sponsorship of Sir Percy, but, notwithstanding the size and scope of the Group's shipping side ship-owning alone proved much too limited to contain the energies of a man who was continually looking for new fields of activity and spurring on his employees with his own example.

Sir Percy had devoted his time and close personal effort to those companies in our Group which have proved the most difficult

to establish firmly. His arena has been the field of battle – battle with the authorities and restrictions, battle with competitors, battle with management, battle with faint hearts. Once a company is firmly established he is content to leave its further development to lesser mortals and looks round for fresh fields to conquer.

While, as already mentioned, the deep rooted desire to get into commercial aviation had long existed, and slowly became a practical possibility as various opportunities presented themselves, even here he has always been found in the hottest part of the fight. It is hard to think how Sir Percy would occupy his mind should 'peace break out'.

The first company in our aviation side to be completely acquired was Field Aircraft Services Ltd., formerly known as Rollasons. It was following the bombing of this company's factory that the sub-contract work for aircraft manufacture then being undertaken, was moved lock, stock and barrel to North Wales. A new company called Necaco was formed – everybody thought it was a baby food – and in an amazingly short time, under the personal directorship of Sir Percy, the company had established a thriving factory on the site of a slate quarry in which the sub-contract work formerly carried out by Fields was done on an increasing scale.

Towards the end of the war, thoughts were turned to the future. An opportunity to move into the field of complete aircraft manufacturing presented itself and very quickly we found ourselves the owners of Percival Aircraft Ltd. The early years of our ownership proved a battle for existence. Faint hearts were appalled at our losses and were ready to abandon ship. Our Captain, Sir Percy, however refused to leave the bridge and battled on. Eventually calm waters were reached and today Hunting Aircraft Ltd., as the company became, has earned a position of significance in the aircraft industry. Regrettably but unavoidably it has recently become necessary to part with control of the company to British Aircraft Corporation Ltd. in line with the merger requirements of the industry's need, although we still remain minority shareholders.

Always thinking well ahead and notwithstanding pre-occupation with Necaco and Percival Aircraft, Sir Percy took the opportunity towards the end of the war of acquiring control of the Aircraft Operating Company. At the outbreak of war all commercial air survey had ceased, staff and equipment being absorbed into the R.A.F. On the termination of the war Sir Percy sponsored the rehabilitation of this company and encouraged the development of a survey organization which is now known throughout the world as the Hunting Survey Group.



In recent years Sir Percy has been deeply immersed in a battle to obtain a place in the sun for private enterprise in air transport. Recently a chink has been made in the Government armour, and some daylight can now be seen for those companies that have survived. Unfortunately the state of the air transport industry made it necessary to accept the view that the merger of individual firms into larger units was a necessity if economic operations were to be achieved and the company to which Sir Percy has devoted so much time, Hunting Clan Air Transport, has been joined with Airwork and others under the merger company, British United Airways.

Currently Sir Percy is devoting his time to the activities of the group of light engineering companies owned by the Hunting Group. At the age of 75 having decided to retire from the Chairmanship of the Group, his energies still remain inexhaustible.

Nothing is impossible so far as Sir Percy is concerned and opposition only whets his appetite. One is reminded of the notice outside a car repair service station, 'the difficult jobs we do while you wait, the impossible take a little longer'.

There is no one in the Group who has not heard the words 'Market Research' pass through Sir Percy's lips. He is a great believer in thorough investigation into all matters likely to help in making a decision on any business problem. This is not only confined to our own business but he is continually impressing on everyone the need for news and intelligence on all political and economic affairs. 'Keep your ear to the ground' is another oft repeated exhortation. He encourages his employees to travel and keep their eyes open during such travel. Over the years, in his search for information on matters in which he has been interested, a large and varied number of people have been specially engaged to make such searches. Hunting's M.I.5 is not far short of rivaling the Government's department of the same name.

When dissatisfied with progress Sir Percy has often been heard to accuse an employee of 'sitting still and doing damn all'. Should anyone feel at all sore at such accusation he must, having read the above, have some balm in the knowledge that it comes from a man who has never sat still and has done all damned well.

Sir Percy himself has earned great respect and prestige in the business world. He is an employer who inspires loyalty and is most approachable. One can express one's views without fear even though they may be completely contrary to his own. He probably won't agree with you anyway and he will be right nine times out of ten, often merely on a hunch. He is of course noted for his hunches. If we ever had a Hunting Museum, pride of place should be given



*Mr. Lindsay Hunting  
The new Chairman*



*Mr. Pat Hunting  
Vice-chairman*

to Sir Percy's shaving mirror before which most of his ideas are understood to have been 'hatched'.

Recently we were all delighted to learn that he had at last earned the recognition due to him. The Knighthood bestowed on him by Her Majesty, so well deserved, has been earned the hard way – *Ad Adastra per Ardua*. Due to his large diversification of interests it has not been easy for outsiders to see the correct picture or to fully appreciate his efforts as a whole. He has been the driving force in all our activities but in many instances behind the scenes. His has been the job of pioneer; money is only of secondary interest to him although he recognizes it as a necessary evil. In many ways Press publicity, that appears from time to time, give an entirely wrong idea of Sir Percy; such expressions as 'Millionaire Hunting' tend to give the impression that he is only concerned with making a family fortune which is not only misleading but indeed completely contrary to facts. His life has been devoted to the development of a variety of businesses, mainly in services which are of importance to the Nation as a whole.

Very little is known of Sir Percy's hobbies – probably because he has had little time for them. For a time he became interested in building an up to date modern farm on his estate at East Hoathly. This is now let to a tenant. He is keenly interested in his garden, particularly in the cultivation of trees. In recent years his cine camera has been an important part of his equipment on all his travels and he has many interesting films to show his friends.

At one time he was keenly interested in yachting and cruising. In his younger days, too, whilst Sir Percy was never perhaps a keen golfer, he was no mean exponent of the game. Some years or so ago the writer

played with him at the Capilano Club, Vancouver and always remembers his effort at the last hole, a formidable long uphill hole of about 550 yards, which was duly completed by Sir Percy in a magnificent bogey five. Recollections of his next effort at golf a year or so later find him on a slightly different plane. This was at Harpenden in a Hunting Aircraft Company outing. Playing with borrowed clubs and balls, he conceded best to 'Colonel Bogey' after six lost balls in the first five holes, being unable any longer to meet the look of pain on the face of his ball supplier. He hit a long ball but had not become associated with guided missiles in those days. Strangely enough, a little later, persuaded to try his hand again by someone who still had faith in him, he finished the last eight holes without further loss and returned his last borrowed ball in triumph to the lender.

He takes pride in his four grandchildren, the two sons and two daughters of Mr. and Mrs. Pat Hunting.

A few years ago a great sorrow befell Sir Percy in the loss of his wife after a number of years of illness. His recent marriage to his late wife's sister has given us all the greatest pleasure and we wish him and Lady Hunting every happiness. He can now enjoy his retirement without the loneliness that might otherwise have accompanied it.

Somehow or other, however, it is difficult to imagine this gentleman sitting down and enjoying his retirement like you or I. He is to continue a number of his directorships and inevitably he will have his teeth into something or other and will continue to be a pioneer, in the words of his family motto, '*Ad finem*'.

We wish him long life, good health and happiness.







# Field Aviation Centre opens at Toronto

SERVES NEEDS OF EXECUTIVE AIRCRAFT

*Last October at Toronto International Airport, Malton, Ontario, Mr. John R. Baldwin, Federal Deputy Minister of Transport, officially opened the new million dollar executive aircraft centre of Field Aviation Company Ltd., a member company of Hunting Associates Ltd., of Canada.*

THE NEW CENTRE, which serves the needs of both personal and executive aircraft, either in transit or based at Malton, includes Imperial Esso aviation fuelling services. Aircraft using the new facilities range in size from small single-engined planes to 4-engine jets and turbo-props. Field Aviation has now become Canada's largest 'fixed base' airport service operator, having similar hangar and services at their Calgary, Alberta base, which was opened in 1959.

Both the Toronto and Calgary centres were designed with an eye to the future, bearing in mind the new concept of using personal aircraft for executive travel. It is astonishing that this type of flying already accounts for more hours per year than the combined hours of every airline in North America. Although this perhaps becomes less astonishing when one realizes that there are over 60,000 private executive aircraft in the area.

The aircraft vary widely. Some are 7,000 dollar single-engine two-seaters; some are enormous jet and turbo-prop flying executive suites. In Toronto, alone, there are five in this second category.

To match this great, new, expanding way of life, Field Aviation has realized that a new concept in hangars and services is needed. Eighty ton pre-stressed concrete beams, which give exceptional strength, allow the spanning of large areas without supporting columns. Maintenance facilities match the sophisticated technical systems incorporated in new aircraft. Special



*OPPOSITE: Hoisting one of the two main beams into position during construction of the Field Aviation Executive Aircraft Centre at Toronto International Airport. Each of these two beams weighs 80 tons, and is made of pre-stressed concrete poured and constructed on the site*

*RIGHT: Refuelling in progress at the Field Aviation Company Executive Aircraft Centre at Toronto International Airport, Malton, Ontario. Facilities include Imperial Esso Aviation Fuelling Services*





*Views of the Field Aviation hangar at Calgary, where similar facilities are offered to aviation users as are offered at Malton. West Coast Airlines are now making an overnight stop at the Calgary hangar with their Fairchild F-27 Turbo-prop Friendships, in preparation for their morning flights to the U.S. Pacific Northwest and San Francisco. One of the Friendships is seen in the photograph above*

RIGHT: R. E. McCullough, Manager, Field Aviation Co. Ltd., Calgary, Alberta





ABOVE: Field Aviation Executive Aircraft Centre hangar at Toronto International Airport, Malton, Ontario. Passenger lounge is on right

RIGHT: L to R. Mrs. Olive Beech, President Beech Aircraft Corporation; Mr. John R. Baldwin, Federal Deputy Minister of Transport; Miss Turnbull of Turnbull Elevator Co. Ltd.

BELOW RIGHT: L to R. Mr. Baldwin; Mrs. Beech; Mr. D. N. Kendall, President, Field Aviation Company Limited; Mr. Victor Koby, General Manager, Field Aviation

features of both the Toronto and Calgary centres are the streamlined service facilities available for aircraft, passengers and crews. To ensure speed in maintenance, work not only on the airframes but also on all electronic gear and other systems is done at the airport. For passengers and crews there are lounges, flight dispatch facilities, weather teletype and close circuit weather television.

Both the Toronto and Calgary centres, serving Eastern and Western Canada respectively, are operated on a twenty-four hour day, seven day week schedule, giving the aircraft user maximum utilization.

Basically, Field Aviation and Esso have realized that the aircraft owner has the right to expect the same standards as the motorist gets from his garage. Service facilities have changed to meet the demand for quicker refuelling of larger quantities, as well as a gradual change-over from the consumption of high octane gasoline to jet fuels used by turbo-props and pure jets.

As Imperial Oil themselves put it: 'Field carries a complete range of Esso aviation products, and the service means that private plane owners and executive aircraft operators, chauffeuring businessmen from point to point, can drop down at Field's Malton hangar for hurry-up refuelling and service ... much like an auto driver pulls into a service station.'

To end, we take an extract from the Minister's speech: 'It is therefore, with great satisfaction that I am participating in the opening of this new Field Aviation Aircraft Centre. Like its sister Centre at Calgary, and which was opened last year, this is a type of investment in aviation providing a special kind of fixed base operation which should have its rewards for the owners. Certainly, it will provide a much needed type of accommodation and service for the aircraft owners of today and tomorrow. The Department is well aware of the needs of this section of the aviation population, and we will do our best to support in every way possible, business and executive flying in the matter of airports, the provision of aids to navigation, and reasonable regulations which are kept at a minimum, consistent with assuring safety for yourselves, your passengers and everyone connected with aviation operations.'

'We have been, as I said, expanding our Departmental facilities to better serve aircraft owners and aviation as a whole right across Canada, and we will continue to co-operate as best we can with business and executive aircraft owners and operators in this regard. I am in no way surprised that it is Field Aviation which has been one of the pioneer companies in this type of operation in Canada, and which has launched this particular venture.'





## Facts and figures on Field Centre

### Hangar Area and Storage Facilities

The floor area is 160' x 250' covering 40,000 square feet in two bays. It has a floor load capacity for handling aircraft up to 100,000 lbs. gross weight, with a wing span of 125 ft. and a tail height of 30 ft., such as a Super Constellation, DC-6 or North Star. Power to a capacity of 300,000 watts, compressed air and water outlets are distributed throughout the hangar area and ramp.

### Hangar Doors

Installed by Turnbull Elevators, they are electrically operated simply and easily by the twist of a button. Consisting of six doors in each of the two bays, they have a 30 ft. height clearance and are constructed of steel with sheet metal panels, and run on tracks so that each bay can be opened to its full extent.

### Lean-to Areas

Covering an additional 34,000 square feet on two floors, they include the Field Aviation offices and shops, a passenger lounge and workshops and offices for tenants.

### Ramp Service

Complete ramp facilities are offered for visiting aircraft, including Esso refuelling, oil disposal pits, courtesy car and necessary handling of aircraft during stop-over period.

### Passenger Lounge

Surrounded on three sides by full length windows, which provide a view of the whole of Malton Airport, the lounge is furnished in Scandinavian style and has access to the dispatch counter, which offers a complete communication system.

### Pilot's Dispatch

A completely furnished Waiting Room with rest room and shower is available for pilots' use. With access to the dispatch service, it provides pilots with all necessary flight planning facilities, including DOT weather teletype, weather display and direct lines to the Control Tower, ATC and DOT forecasting services. Closed circuit weather TV is to come. In addition, company telex circuits provide direct communication with telex receivers anywhere in the world, including Field offices in Ottawa and Calgary.

### Sheet Metal and Machine Shop

This shop is fully equipped for maintenance, conversion, overhaul, engineering,

modifications and specialized installations. It includes Magnaflux and Zygo crack detection equipment for inspection of magnetic and non-magnetic aircraft parts.

Field specialize in design, precision manufacture and modification necessary for all types of aviation hardware, backed by the highly qualified staff of the Engineering Department, who act as technical advisers to the rest of the shops in all phases of work.

### Hydraulic Shop

Complete test stand is available which is capable of providing service and overhaul for all aircraft components.

### Paint Shop

The paint shop is designed to be completely fireproof and has special ventilation installed. Equipped with a drying oven and cleaning tanks Field can undertake all aircraft exterior and interior painting. A paint storage room enables a large stock of paint to be kept on hand.

### Fabric Shop

The Fabric Shop is fully equipped for re-covering all fabric aircraft, and includes facilities for upholstering custom interiors.

### Radio and Electronics

The shop is equipped with the latest and most precise equipment on the market today required for testing, engineering, design, servicing and installation of all major manufacturers instruments.

Radio and Navigation instruments handled include Bendix, Collins, ARC, Lear, Doppler and Sarah. Weather radar and ground communications equipment includes both double and single sideband radios. In addition, Field offers expert servicing and installation of all types of airborne and ground survey instruments, including magnetometer, electromagnetometer, Airborne Radiation Detector, precession magnetometer, Airborne Profile Recorder, Ronka ground EM, Seismograph, etc.

A large inventory of small parts is kept in store to enable rapid servicing.

### Stores Department

A large area in the hangar is devoted to a raw materials and parts store. Through handling a large number of agencies for new and reconditioned parts and accessories, catering to almost all types of aircraft and all phases of the aeronautical industry, Field offers a complete General Store for the aviation business.

# Group

### Reorganization in Africa

THE FOLLOWING changes in the Group's companies in Southern Africa have been announced.

#### *Aircraft Operating Co. (Aerial Surveys) Ltd.*

Mr. E. J. D. Pritchard succeeds Mr. W. D. Corse as managing director (an appreciation of Mr. Corse appears on these pages). Mr. G. T. Gibbs, general manager, has been appointed a director. Mr. R. F. Ashdown, the secretary, is now also commercial manager. Mr. F. P. Roos has been made technical representative, responsible for promoting aerial survey for the company.

#### *Hunting Surveys (Rhodesia) (Pvt.) Ltd.*

A Wild A5 plotting instrument has been acquired, and the Company's activities are being expanded. Mr. P. H. O'Brien becomes resident director and Mr. J. Scott, manager.

#### *Field Aircraft Services Africa Ltd.*

Mr. Pritchard becomes managing director, and Mr. S. H. Evans, general manager, a director. The divisional managers are Mr. C. W. Lippiatt, Germiston, Mr. S. J. Evans, Salisbury (Engineering), Mr. R. H. Howard, Salisbury (Instrument and Electrical), and Mr. R. Day, Germiston (Agencies).

#### *Field Aircraft Services Central Africa (Pvt.) Ltd.*

Mr. Pritchard is managing director, the other directors being Mr. S. H. Evans and Mr. J. L. Boon.

#### *Field Agencies Rhodesia (Pvt.) Ltd.*

Mr. Boon has been appointed managing director.

#### *Central African Air Supply Co. (Pvt.) Ltd.*

The directors are Mr. Boon and Mr. S. H. Evans.

### FAMILY ALBUM NO. 1

#### **L. R. Burrows**

LEONARD ROBERT BURROWS, Manager of Hunting Engineering Ltd., was born in London in 1922 and was educated at Raines Foundation School and at Medway Technical College, Gillingham.

He served his apprenticeship as an aeronautical engineer at Short Brothers and

Rochester from 1939-1944, before joining English Electric at Preston, where he worked on the initial design of the Canberra.

He joined Hunting Aircraft in 1946 as a senior draughtsman, rising to assistant chief draughtsman seven years later. His main work in this period was on the Prince/Pembroke aircraft and on the Piston and Jet Provosts. For the last six years he has worked with Mr. R. E. Pedley first in the Weapons Research Division of Hunting Aircraft and then in Hunting Engineering,



L. R.  
Burrows

when it was formed as a separate company, Pedley becoming Technical Director and he, himself, Manager.

Burrows lives at Harlington, a village ten miles from Luton, and is married with two boys. He and his wife run four acres of land, chiefly with tomatoes under glass and apples. He says he finds this relaxing after a heavy day at the Luton factory. He is also a keen golfer and, with his partner, was runner-up in the Group golf tournament two years ago.

## Speeding Iran's Highway Programme

*Huntings at Work on 850 miles of Roads*  
SEVERAL important contracts have been given to Hunting Surveys Ltd. in connection with Iran's new highway programme. 470 miles of the Europe to India highway – between Kerman and Isfahan in Iran have been covered with photography and mosaics. In addition, photography of 386 miles of other motor roads is being carried

out, and 92 miles are being mapped at 1-1000 with 1 metre contours. Air and ground teams from Huntings are now in Iran.

## FAMILY ALBUM NO. 2

### D. T. Bett

DAVID TORRE BETT, the Group Public Relations Officer, was born in 1922 at Haslar Royal Naval Hospital, Gosport, where his father was in charge at the time. Being the last of seven children and the fifth son, it was many years before he got any new clothes, and indeed he can still boast, if that is the word, of two pre-war suits made by an elder brother's Oxford tailors.

He was educated at Marlborough College and afterwards worked in a Government factory for a year, serving also in the Home Guard. His duties in the latter consisted of forming a mobile patrol of two in the depths of the New Forest with an elderly retired bank manager on an ancient motor-bicycle combination. Fortunately this powerful defence unit was never put to the test.

Bett enlisted in the King's Royal Rifle Corps (60th) in 1941 and served chiefly in the Mediterranean area, ending up as a Captain in the Durham Light Infantry. This last regiment gave him some intimate and useful knowledge of both the inhabitants and geography of North-Eastern England when he subsequently joined Huntings.

His first job after the war, lasted a fortnight and he then worked for seven years



David Bett

for the Blue Circle Group of cement companies in the publicity and advertising departments.

When he came to the Hunting Group, he inherited amongst other duties the editorship of the *Hunting Group Review*. The object of the *Review* has always remained the same – to entertain the many friends of the Group throughout the world.

Unmarried, Bett lives in London and chief amongst his outside interests is an unwavering support of Aston Villa and British soccer in general.

## What the Press Say About Huntings

### 'The Guardian' on Mhoglas

'SO MUCH is happening these days to make domestic heating cheaper and more efficient that it almost impossible to keep pace with it. One entirely new method is now making great headway technically – there is, as yet, a limited number of appliances available, but the principle is so simple and so safe that one is impatient for the development of, for instance, the underfloor heating which is promised. Meanwhile, radiators, towel-rails, and skirting-board heating, some applications to horticulture, such as soil heaters, and some useful hotplates are in production.

'Hunting Mhoglas Ltd. (a name which sounds more like big game hunting than domestic heating) of Skimpot, Luton, Bedfordshire, manufacture the element used throughout. This was the result of the requirements of the aircraft industry which wanted large areas heated to relatively low temperatures, extremely evenly and safely. The answer was eventually found in a mesh of glass fibre, activated by graphite. Since each strand of glass fibre is composed of about 120 tiny monofilaments, each one of which is coated with the graphite, there are thousands of microscopically fine conductors in parallel. Bonded and locked between suitable coverings, such as Sewdish Masonite (hardboard), Mhoglas can be used to maintain even heat from a few degrees above ordinary room heat to 220 deg.C. with completely even distribution of heat.





*Picture of the Hunting family taken on the occasion of the dinner to Sir Percy and Lady Hunting. Left to right standing are Sir Percy, Mr. Richard (Senior Resident Director, E. A. Gibson Ltd.), Mr. Clive (Group Director) and Mr. Pat Hunting (Vice-chairman); Mrs. Clive and Mrs. Pat Hunting; seated Mr. Lindsay Hunting (Chairman), Mrs. Lindsay Hunting and Lady Hunting; in front, Mrs. Richard Hunting*

'This explanation of the principles involved is necessary to understand how important the domestic uses of what was intended for industrial purposes can be. As there is no fire risk, heating panels can be used anywhere: humidity presents no problem. Panels can be let in almost flush with a wall, finished with stove-enamelled paint, and are very inconspicuous. The efficiency is remarkable; no one quite knows why a 300-watt panel seems to have a 500-watt capacity, though it is probably something to do with the very quiet distribution of constant heat, unvarying in temperature; but it has to be tried to be believed. Prices are £6 8s 2d for a 300-watt wall panel, £8 12s 8d for a 500-watt panel, £7 7s 10d for a portable heater, and £9 7s 4d for a towel-rail heater.

'Underfloor heating is in an advanced state of research: there are a number of

problems connected with insertion into various floor materials which must be completely solved before marketing; but it will soon be possible, we hope, to buy flooring with the heating element already embedded in it – and the construction of Mhoglas makes breakdown virtually impossible; there is always another thread to take up a local break: it cannot 'short'.

'Meanwhile another firm, Morheat of Church Path, Fareham, Hampshire, is using Mhoglas elements in a range of radiator panels and skirting heaters, plus a towel rail and a hotplate. Prices for all these virtually everlasting products are pretty good: it would be impossible to give them all, but a 300-watt panel can cost about £8 8s (there is a terribly useful Morheat Minor, using only 50 watts as an anti-freeze job for £2 5s. (A 599-watt panel costs £10).'

#### **Dining Out Sir Percy**

JUST BEFORE CHRISTMAS senior members of the Group dined out Sir Percy and Lady Hunting and the other members of the Hunting family on the occasion of Sir Percy's retirement. Sir Percy and his wife were presented with a Chinese porcelain vase (famille rose). It was especially pleasant to have the two senior Canadian members of the Group, and their wives, at the dinner, Mr. and Mrs. Bill Green and Mr. and Mrs. Douglas Kendall.

#### **Mr. W. D. Corse Retires**

##### *An Aerial Survey Pioneer*

WILLIE CORSE, managing director of Aircraft Operating Co. (Aerial Surveys) Ltd. of South Africa, retired at the end of 1960. He was a pioneer, writes F. L. Wills, one of his oldest friends, and who himself

*Continued on page 16*





*The m.v. 'Duffield' seen off North Shields after her conversion to a bulk-carrier had been carried out by Smith's Dock Co. Ltd. The conversion of a second Hunting ship, 'Gretafield', is nearing completion by the same company*



*RIGHT: The new Hunting travel premises, now at 30 Neville Street, Newcastle-upon-Tyne, just opposite the Central Station. Newcastle's daily newspaper 'The Journal', described the travel centre as the most modern of its kind in Newcastle. The main points include special travel facilities for businessmen*



retired recently from Hunting Surveys Ltd. – of air photography and survey from the very early days, when it was still an adventure to put an expedition in the field.

Willie Corse, after three years photographic apprenticeship, joined the Royal Flying Corps in 1914 and worked on the development of air photography under Colonel Trenchard (later Lord Trenchard). In 1921, he was photographic officer to the first overseas air survey expedition – to the Orinoco Delta. Later he went to British Guiana, Newfoundland, Iran, Argentine and Northern Rhodesia, the latter for a



W. D. Corse

60,000 sq. mile mapping assignment in the copper belt.

In 1931, he became chief photographer of A.O.C. in South Africa, and took part in the Company's first contract – surveying south Durban. With headquarters in Johannesburg, survey operations quickly expanded through southern Africa.

During the last war, when A.O.C. was 'called up' as a photographic squadron, he became War Staff Officer, Air Photography, with the rank of Major. With the return of peace (when the Company joined the Hunting Survey Group), he became general manager of A.O.C. and, seven years later, managing director. During these years, the Company was equipped with the latest plotting machines and cameras.

Willie Corse will always be remembered in the air survey world as one of the early pioneers, and his many friends will join with me in wishing him and his wife Pat, and their daughter who is married and also lives in Johannesburg, many happy years.

#### Hunting Survey Group in Australia

##### Minister Praises Adastra's Work

ADASTRA AIRWAYS PTY. LTD., the Hunting Survey Group's Australian associate has sent us news of two recent contracts. *Photographing an Australian Desert*

The work of Adastra has been the subject of favourable comment by Australia's Minister for National Development, Senator W. H. Spooner.

He referred to mosaics made from aerial photography of the Gibson Desert area in Western Australia by an Adastra crew.

They flew a Lockheed Hudson at 25,000 feet, using a Wild RC9 camera, on a

contract for the Commonwealth Division of National Mapping.

The resultant photography was so accurate and of such high technical quality that officers of National Mapping in Canberra complimented Adastra.

A major American oil search company requested mosaics of the area, much of which is a wilderness of sandy desert. The Americans were so appreciative of the quality of the photography that their reaction prompted Senator Spooner to make their remarks public in a general press release.

#### Mapping the Great Barrier Reef

Not since 1890, when Royal Navy survey ships were in the area, has the Great Barrier Reef of Australia been mapped.

The reef extends from three to 120 miles offshore down the Queensland coast. Besides being regarded by naturalists as one of the world's most fascinating areas because of the colour and variety of the tropical fish which teem amid the coral, it also poses many problems in navigation.

As a defence measure, re-mapping of the area was considered vital because the passage between the reef and the mainland will be an important tanker and supply ship route in the event of war.

To enable the Commonwealth Division of National Mapping to re-map the Reef, Adastra is photographing 60,000 square miles of the area. Offshore navigation is being done with the required high degree of accuracy by the use of Marconi Doppler radar navigational aid.

#### FAMILY ALBUM NO. 3

##### Phillip Irin la Sage

PHILLIP IRIN LA SAGE was born in September 1922 and joined Lord Pentland, as his assistant, in Hunting Surveys, Inc., New York, in 1953.

When asked where he was born he enjoys to reel off that it was in Waupaca, Wisconsin, and that Waupaca derives its name from a Red Indian Chief, and that it is the county seat of Waupaca County, located on the Waupaca River at the end of a chain of twenty-three lakes. la Sage says he finds it a beautiful place in summer, but describes it



Phillip  
Irin la Sage

as 'colder than hell' in winter after having been used to living in India and the South.

He has a Bachelor of Arts degree and has read Political Science at Colorado College.

From 1942-45 he served in the U.S. Marine Corps in the South Pacific, and it was there that he became interested in photo interpretation work. For the following two years he did photographic interpretation for the U.S. Government. Later he became Vice Consul in the U.S. Consulate General in Calcutta.

In Rockefeller Centre, New York, Lord Pentland and he play a vital part in promoting the activities of the world-wide Hunting Survey Group, and in securing work and maintaining contact for the Hunting companies with international and government organizations as The United Nations, The International Bank (World Bank), and the U.S. Government's International Cooperation Administration, as well as the ever increasing number of American oil, mining, and engineering firms with overseas interests.

Golf and gardening are his two main exercises, and he enjoys reading and listening to music; although he is sceptical of his own success with the tuba, which he learned when he was younger.

#### The Work of H.T.S.

LATELY Hunting Technical Services Ltd. has been much in the news with important contracts in Burma, Pakistan and Italy. These and other contracts emphasize the ability of H.T.S. to undertake complete projects in the field as Natural Resources Consultants.

The Company is essentially a group of scientists formed to carry out basic appraisals of natural resources and studies for their development. It offers both a fact-finding and a consultancy service.

#### What Ship, Where Bound?

THE FILM on the Hunting fleet, 'What Ship, Where Bound?' has now been completed. It runs for some 20 minutes and is in 16 mm. colour/sound. It has been produced on behalf of Hunting & Son by Brian Everitt, who also produced the Hunting Survey film 'Based on Deception!' Suitable for general audiences, it shows the activities of the Hunting fleet of oil tankers and bulk carriers.

The title is taken from the traditional hailing station call still used today. Copies are held at Hunting & Son Ltd's offices at Milburn House, Newcastle-on-Tyne 1, and at the Hunting Group's public relations office at 4 Dunraven Street, London W 1.

Other films obtainable from the latter address are the Hunting Technical Services' productions 'Reclaiming the Desert' and 'A Share in Their Tomorrow!'





# Trading with China

AS A COUNTRY with a population which, today is of the order of 650 million and increasing at the rate of 12 million a year the trading potential of China is clearly enormous. If relative population size was the only criterion, China would easily top the list. It has, however, a very long way to go before its standard of living and its per capita trading potential can match that of the more industrially advanced nations of the world.

During the three thousand years of its recorded history, China has been essentially an agricultural economy, largely self-contained and having little need to rely on foreign trade for the necessities of life. Its failure during the last century to adapt itself to the industrial progress of the West caused the loss of its former great power and influence, and it is this situation which it appears to be the primary object of the rulers of the People's Government of China to reverse. Their purpose is to make China into a great economic and industrial power, matching the size of the territory and population which they govern, and to achieve this in the shortest possible time.

The wars and disturbances of the thirty years preceding the emergence of the communist regime, left China with virtually none of the essentials for their purpose if one excepts their own determination and the manpower of six hundred million hard working people. If one could visualize what the United Kingdom would need to change overnight from an agricultural community to her present degree of industrialization, this would give some idea of the enormity of the task which China has set out to accomplish.

What China is thinking and doing  
is one of the biggest question-marks facing the world today.  
An expert on Chinese affairs  
has contributed this intensely interesting article  
which deals with one aspect—business relations.

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LEFT: Part of a large tract of wheatland at a people's commune in Licheng, Shantung Province, cultivated in garden-style in pursuance of the Eight-Point Charter for Agriculture





*A batch of 54 h.p. tractors manufactured by the Loyang Tractor Plant in Honan, ready for delivery*

RIGHT: Irrigation and drainage equipment mass-produced by a water pump plant in Harbin, Heilungkiang Province, to meet the growing needs of agriculture

Initially, virtually all of the plant and machinery, and especially the technical knowledge required for their installation and operation, had to be obtained from abroad and means found of paying for it. China had no income from commercial services or overseas investments and no foreign currency reserves. Some useful long term credits were made available by the USSR but these were small in relation to China's needs. Offers have been made by other Western nations including our own, to discuss the provision of long term credits but they have been politely but firmly refused.

With an economy which is largely agricultural, China has to rely mainly on agriculture and related activities to provide the bulk of the exports which she must make in order to pay for imports.

Despite substantial increases in agricultural production, China's domestic demand is also rising, both to feed her growing population and to supply the needs of industry. The surplus available for export is therefore limited and is the main determinant of the size and pattern of her international trade. China's requirements are, however, virtually unlimited and she is accordingly compelled to plan carefully, and to establish a very strict system of priorities for her imports, giving the precedence to the plant and machinery requirements of her industrialization plan. Most of the remainder of her imports consists of petroleum products and such raw and semi-processed industrial materials as cannot yet be produced domestically. Consumer goods account for only about

6% of imports: there are no luxuries.

For ideological and strategic reasons, China obtains practically the whole of her imports of heavy plant and machinery from other members of the Communist bloc. Purchases from the rest of the world are largely industrial raw and semi-processed materials, such as rubber, cotton, chemicals, ferrous and non ferrous metals, together with light and ancillary machinery, transport and communications equipment, and agricultural machinery. The broad line of demarcation for the supply of goods in the mechanical field appears to be that equipment of a key nature, requiring a fairly long period for manufacture, or needing the despatch of technicians for erection and the training of operators, is purchased from communist countries. An

important determinant in the adoption of this policy by China is the continued application of the embargo. It will be remembered that this was imposed by resolution of the United Nations in 1951 as a consequence of the armed intervention by China in the Korean War. Its purpose was to prevent the supply to China of goods of military or strategic value, and originally it covered a very wide field. Although the range of products on the embargo list has been reduced substantially in recent years, so that the number of non military items affected is relatively small, this is a case where the mental reaction engendered by its existence is all important. It is therefore difficult to visualize any marked change in this policy until there is an improvement in political relations between East and





West and a general easing of tensions.

So far as trade in other items is concerned, the British industrialist is at least as well placed as that of any other non communist country, possibly somewhat better. China conducts most of her trade on a bilateral basis, and where this is not covered by trade Agreements, gives preference to those countries which keep purchases and sales approximately in balance. In this important respect, the United Kingdom gets full marks.

The bulk of U.K. exports to China during recent years has been industrial raw or processed materials including wool tops, steel sheets and plates, tinplate, copper rods, chemicals and dyestuffs, pharmaceuticals, synthetic rubber and yarns. Whilst some growth in this sector may be anticipated, the real potential will almost certainly continue to lie in the field of machinery and equipment. We have made some progress in the light engineering side, supplying machine tools, agricultural tractors, radio and electronic equipment, mechanical handling equipment such as cranes and fork lift trucks, railway supplies and automation aids. It is to be hoped that in due course the goodwill generated by the supply of equipment of this nature, will open up possibilities for the sale of heavy machinery and complete plants.

On the import side, one of our difficulties for some time past has been to obtain from China an adequate and continuous supply of the bulk agricultural products which have traditionally formed the backbone of our trade. These include such items as oil seeds, eggs, bristles, tea, wood oil, animal feeding stuffs and so on. There is, however, a steady growth in offerings from China of processed rather than raw agricultural products, of the products of light industry, handicrafts and minerals which offer scope for the newcomers. China is particularly desirous of expanding this side of her exports in order to reduce her reliance on primary products, and to add as much value as possible to the limited quantities of raw materials which can be made available for export.

In this context it must be noted that in November 1959 the Board of Trade announced that China would in future be placed on the same basis for import control purposes as the other communist countries. This involved the imposition of quota controls on a number of products which, up to then, had been freely importable. Unfortunately, a number of the products affected came in the category of manufactured or processed goods, and although in most cases, the quotas leave ample room for an expansion of trade, Peking has taken strong exception to their imposition on grounds of principle.

Perhaps the most difficult aspect of the China trade for the newcomer is that of



ABOVE: *Su Kuang-ming, a veteran engineer and labour hero from the Harbin Rolling Stock Plant (third from right) helps a production brigade of a people's commune to repair a farm machine. He is one of the members of a group (including 400 workers from Harbin, one of the largest industrial cities in Northeast China) who are passing on their technical skills to rural commune members in Heilungkiang Province*

BELOW: *A 1,540-pound porker raised by a people's commune in Shensi Province*







making a start. This arises primarily from the character of the trading organization appropriate to a state controlled economy. The whole of China's overseas trade is done through the medium of State Trading Corporations of which there are some eighteen. Each handles the import and/or export of a definite range of commodities. It is very rarely indeed that the seller or buyer has an opportunity of direct contact with consumer or producer, and all transactions have to be arranged through the appropriate Trading Corporation. All offers to supply, for instance, electrical machinery, have to be submitted to the China National Machinery Import Corporation. It can well be imagined that with a product as widely manufactured as this,

the Corporation builds up a tremendous file of potential suppliers and has considerable difficulty in choosing between them when they are ready to buy. The Corporations do not publicise in any form their trading programme for the year and a potential supplier does not know if or when they are likely to be in the market for his product. He may be confident that it is needed, but has no means of telling where it stands in the list of priorities which China is compelled to establish.

Given this situation, the best advice that can be offered is for the would be trader to adopt a long term continuous programme for keeping his name and that of the products in which he is interested before the Trading Corporations and others who

may further his cause in the hope that some day, perseverance will have its reward. Once the ice has been broken, and the first transaction successfully completed, the chances of further business are substantially improved.

The initial point of contact should be with the Office of the Chinese Commercial Counsellor at 6, Gloucester Gate, Regent's Park, London N.W.1. This is a very busy office and an introduction from your Chamber of Commerce or from one of the Organizations specializing in the China trade, is likely to be helpful. They will furnish a list of the trading corporations and will state which one deals with your products if there is any doubt on this point. It is unlikely that they will be able to advise



ABOVE LEFT: *Building a section of the Lanchow-Sinkiang Railway with a track-laying machine across the Gobi desert in Northwest China*

ABOVE CENTRE: *A Chinese built plane sows tree seeds over the denuded hills in the Northwest province of Chinghai*

ABOVE RIGHT: *A section of the 5,000 km 'shelter belt' planted a few years ago in the sandy area of the Kansu Corridor in the Northwest*

LEFT: *12-row seeders produced by a machine building plant in Kiangsu Province*

OPPOSITE: *Motor lorries drive out of the Wuhan Iron and Steel Works, one of China's biggest steel centres, sending machinery and tools to the countryside. This marks the climax of the recent mass activities to aid agricultural production. The equipment is conveyed by a team of skilled workers who install the machines and pass on their technical knowledge to the peasants*





you on trade prospects but an appropriate supply of literature should be left with them. A letter, which may be in English, should next be addressed to the appropriate Trading Corporation with several sets of literature. These contacts should be renewed at regular intervals and the supply of literature kept up to date.

If you think that prospects of business warrant it, you may apply both to the Commercial Counsellor and to the Trading Corporations for permission to visit China. Visas are not issued without careful consideration, and rarely unless the Chinese Trading Corporations themselves think that a visit would be of mutual benefit.

Export fairs are held regularly in Canton in May and October which are attended by

representatives of both Export and Import Corporations. Invitations to visit these Fairs are usually issued freely and provide a very useful means of making personal contact with Corporation officials.

There are no British trading companies now resident in China, nor is it possible to maintain a permanent representative in the country. A most valuable point of contact is Hong Kong which is only a day's journey from Canton. There are many business houses in Hong Kong which have a long experience of the China trade and may be prepared to act as Agents for Sellers and Buyers in the U.K. China itself maintains a large trading organization in Hong Kong, the China Resources Company and this provides a valuable means of contact. In

general, the Chinese express preference for dealing direct with manufacturers. They realize, however, that this is not always practicable and do not appear to discriminate against Agents or Merchants, many of whom can offer the advantage of doing two way trade.

Most trade with China is financed through the medium of Letters of Credit, which in the case of sales to China are opened by a branch of the Bank of China in China, and advised through the Bank of China Office in London at 147 Leadenhall Street, London E.C.3. For purchases from China, the buyer is normally required to pay cash on presentation of documents in London. In the case of sales to China, short term credits are frequently asked for and the tendency of recent months has been for the usance required to be lengthened, with 180 days the normal maximum.

China prefers to use its own form of contract for both purchases and sales but the terms are by no means standardized. Owing to the distance, and difficulties of personal contact, much business is transacted by the exchange of telegrams. It is desirable to ensure that the terms of contract are clearly stated before confirming the purchase or sale. Despite the inadequacies in the wording of some contracts, the general experience is that provided that the trader here acts in good faith, no advantage is taken thereof by the Chinese.

The terms of payment and of contracts are, of course, subject to negotiation but the Trading Corporations are not normally ready to modify their initial terms unless the transaction is of substantial size or concerns a 'non standard' item for which the usual conditions are not appropriate.

Enough has been said to show that trade with China has its peculiarities and its pitfalls, but that is true in some degree of most overseas markets. The difficulties do not in any case differ materially in character from those obtaining with other communist countries. The qualities needed above all for successful participation in the China trade are understanding and perseverance. Our trade with China is still not large. In 1949 at £44 million it was only 0.6% of our total overseas trade and about 3.1% of China's total trade. But in the last six years it has trebled in value and should continue the steady improvement which it has made both in absolute figures and in its share of China's trade. The time must come when China, in common with the communist countries in Eastern Europe, will be ready to open her markets more widely than she does today, and we have our own part to play in bringing this about. When this happens, the companies which have persisted in their efforts under the present less favourable conditions, should reap their reward.



# Halmatic joins Huntings

## Newest Group Company is world leader in reinforced plastic boat hulls

Halmatic Ltd., the world's leading Company in the building of reinforced plastic boat hulls – it recently exported a 67 ft. hull, the biggest one-piece reinforced plastic moulding ever made, to the United States – has joined the Hunting Group. The Company intends to increase its production of standard hulls and to continue its research and development programme. A new factory near Leicester has been opened to supplement the Portsmouth works.

Greater support will be given to that section of the trade which is interested in the marketing and fitting-out of hulls. Apart from items already supplied integral with the hull, such as tanks, decks, coach roofs and centre board casings, associated companies are to fabricate metal parts which boat builders normally put out to sub-contract. These include keels, stern gear, pulpits and stanchions.

Halmatic Ltd. has gained a vast experience in the building of these boat hulls, ranging from small boats to big motor yachts. With this technical knowledge, and with the engineering background of the Hunting Group, particularly in aviation and shipping, the company is now ready to make its resources available to general industry.

Halmatic Ltd. is to continue to manufacture a top quality product giving, at the same time, a service to boat-builders and boat-users which is second to none.

*Mr. Geoffrey Wood, the Editor of 'Shipbuilding Equipment', has contributed the following description of Halmatic's work in the reinforced resin boat-building field. One of the most interesting facts, as Mr. Wood says himself, is the way in which the hulls stand up to rough treatment. Like Nelson's ships at Trafalgar, they are built to last.*

IT WAS IN 1952 that Halmatic began the experimental work which led to the construction of the first Uffa Fox designed 'Flying Fifteen' to be built in reinforced resin. The boat was a success, and hulls are still being laminated from the original mould, despite the fact that the size and shape of the hull, coupled with rigging strains and unusual keel configuration, probably made it one of the least suitable of yacht forms for construction in 'Deborine', as the Halmatic laminate of polyester resin reinforced with glass fibre was named.

The 'Flying Fifteen' showed, more readily than most other shapes would have done, that 'Deborine', being comparatively thin to meet a given strength requirement, needed some sort of framing if it was not to be too flexible. This led to the development of the Halmatic hollow 'top hat' frame, which is integral with any structure where it is used and which has formed the basis of the structural strength of all Halmatic built hulls.

The first 'Deborine' hulled power boat was a 26 ft. medium speed motor boat of which two were built for the Admiralty to their own design. Fitted out in an entirely conventional manner, by the boat-building firm of Lady Bee at Shoreham, these boats travelled the world with the trials cruiser, H.M.S. *Cumberland*, and were proved to be able to stand up to the most rigorous services in all climates from the tropics to the Arctic. Before this mould was discontinued, considerable numbers of these 26 footers were built for a wide variety of purposes; naval, commercial and pleasure.

A big step forward, in 1954, was the

completion of the aptly named *Perpetua*, a 45 ft. long twin screw, diesel powered motor cruiser, designed by Peter Thorneycroft for Mr. P. D. de Lazlo, managing director of Halmatic Ltd. This boat attracted a great amount of attention and her success probably put the seal on future development in the field. She was of a size to interest seriously operators of small commercial craft who, although they were willing to concede that 'Deborine', as a material, had many advantages to offer such as strength coupled with lightness, ease of maintenance, immunity from attack by marine borers, corrosion in its various forms and galvanic action, had not hitherto been convinced of its suitability for the type of craft in which they were interested. Unfortunately, the mould for this boat was damaged beyond repair and *Perpetua* was the only hull of her class.

A larger boat still followed, in the *Bebe Grande* built in 1954, a 54 ft. hull of tank tested design by Burness, Kendall and Partners, built and fitted out as a luxury yacht, for Mr. Jack Gerber. *Bebe Grande* had a highly developed round bilge hull form and was capable of a speed of 20 knots on a displacement of 15 tons when powered by two 220 b.h.p. marine diesel engines. She was shipped to the Belgian Congo and from there proceeded to South Africa under her own power, where she is now based, and is still as good as new.

A sister hull, with a reduced sheerline, was fitted as a general purpose launch and work boat and has seen hard service in Aden.

Next came a smaller hull of 31 ft. the



*A Halmatic '56' fitted out for British Petroleum Co. Ltd. for service in Aden*

first of which was finished as a boarding launch for Southampton Trinity House Pilots and the second as a managerial launch for Elders and Fyffes' West African Cameroon plantations. The pilot boarding launch, proved if proof was still needed, that 'Deborine' hulls are capable of withstanding and absorbing enormous punishment. *Jessica*, as she is named, has three crews and has been in service twenty-four hours a day since she went into service in 1956 and goes alongside a ship or jetty once every half to three-quarters of an hour. Two incidents which would have laid a wooden vessel up for a matter of weeks for repair were dealt with in a matter of hours and the black hull can still be polished to a mirror finish.

Numbers of '31' hulls have been completed in various commercial and pleasure guises.

Probably the most well-known of the Halmatic range of hulls is the '56', an improved and extended version of the *Bebe Grande* class. These new boats incorporated, for the first time, integral fuel tanks which also served as engine bearer foundations; built of 'Deborine', these structures became part of the hull when moulded in, and added greatly to the overall strength.

The first of the line was completed as a yacht and was shipped to the Bahamas, the second was fitted-out as a 20 knot V.I.P. launch for service at the British Petroleum Company's refinery at Aden, while a third hull was again fitted as a yacht. A group of three '56's' was then completed as patrol boats, mounting 20 mm. Oerlikon guns, for the Portuguese Navy; powered by Cummins diesel engines these boats were capable of a speed of 20 knots.

The '56' showed how adaptable a suitably designed hull could be, serving equally well

pleasure, commercial and naval purposes.

The worth of Halmatic form of construction, with its cachet of a Lloyds' Certificate, became obvious in 1957 when John G. Alden, the noted firm of American naval architects, placed an order for a dozen, a number subsequently increased, of a specially designed 36 ft. centreboard yawl. These hulls, the first large sailing boat mouldings of their type, were fitted-out in Denmark and Holland for shipment to America where they are enjoying considerable success.

The *Challenger* yawl was followed by two other Alden designs, a 42 ft. twin screw motor yacht and the largest ever, a 67 footer, both of which have been shipped

to America for completion. Other moulds – sailing yacht designs – are under construction.

The spread of the Halmatic hulls round the world has given practical proof of their suitability for all conditions and climates. The spread of the reinforced-resin craft in the small craft field is clearly accepted and growing.

Although the firm is based on the construction of boat hulls, the material 'Deborine' is suited to many other purposes, and structures built, range from submarine trunk casings to sugar vats and from large bore pipes to sluice gates for atomic power stations. This incursion into the engineering field is also expanding rapidly.

*A sugar storage tank constructed by Halmatic in reinforced plastic is only one example of the many uses to which this new material may be put*





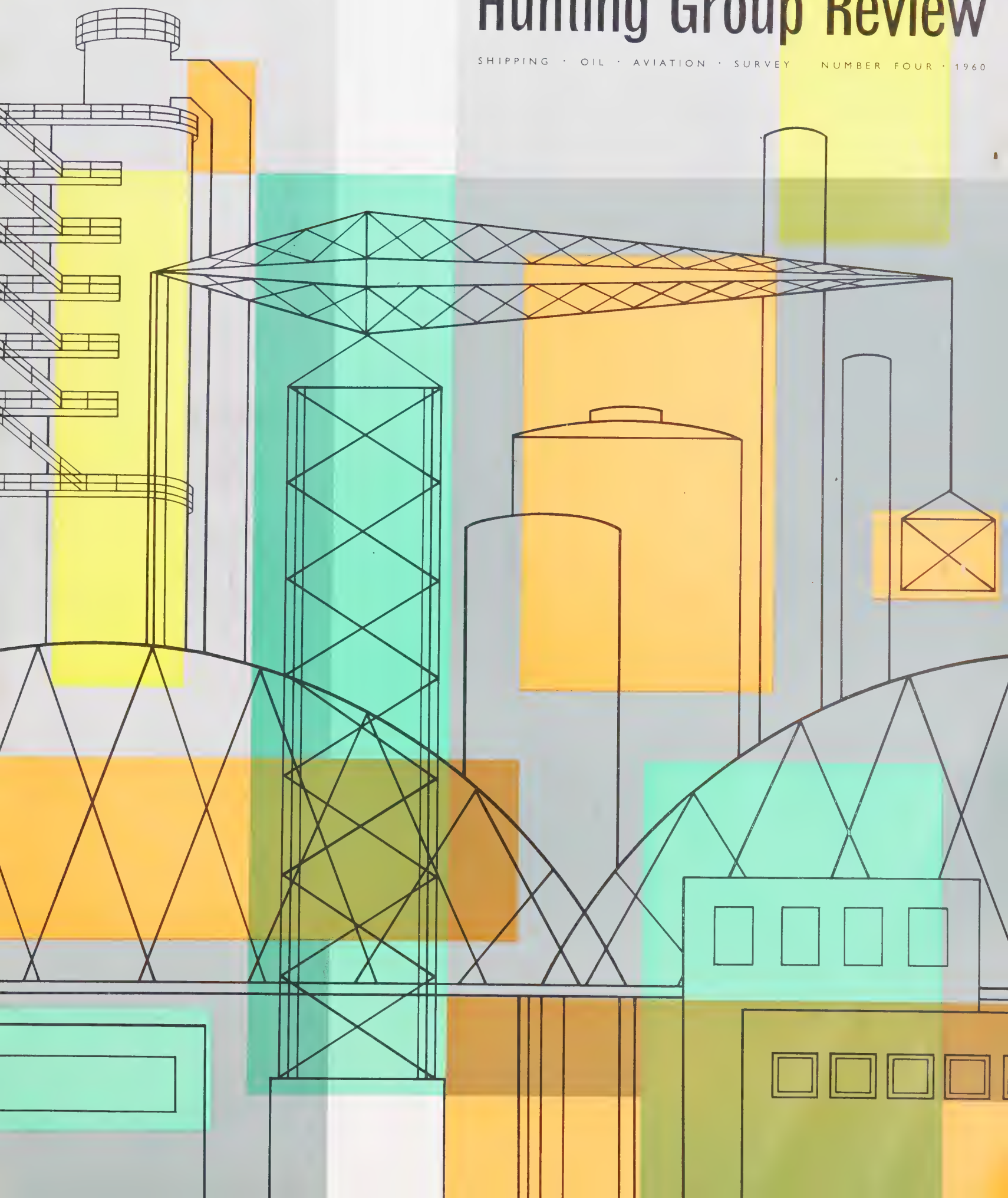


*A Halmatic hull ready to leave the factory for the United States – 67 ft. in length it is the world's largest single-piece plastics moulding  
Hull design is by John Alden & Co. of Boston*

AR28

# Hunting Group Review

SHIPPING • OIL • AVIATION • SURVEY NUMBER FOUR • 1960





# Hunting Group Review

NUMBER FOUR - 1960

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Editorial Offices: Norwich House, 4 Dunraven Street, Park Lane, London W 1

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Hunting Mhoglas Ltd. - Wm. Latimer & Co. Ltd. - Trills (Builders & Contractors) Ltd.  
Ronka Geophysical Instruments Ltd. (Canada)

\*Associate companies

Hunting Group Review



*The cover, by Valerie Phipps-Smith, symbolizes the work of Wm. Latimer & Co. Ltd. whose story is given on page 4. The Company is a member of the Hunting Group, and the results of its work as painting contractors may be seen all over Britain.*



SHIPPING

OIL

AVIATION

SURVEY

INDUSTRIAL

# Editorial

THERE USED TO BE – in fact, of course, there still is – a song, which I sang in my bath and which started – ‘A you’re adorable, B you’re so beautiful, C you’re a cutie full of charm.’ I never knew any more of it except the ending which went something to the effect that ‘alphabetically speaking you’re O.K.’ This last statement would seem undeniably true if the D-Z section was up to the level of A, B and C.

Again speaking alphabetically, the Hunting Survey Group seems to be O.K., too. Anyhow readers may judge for themselves from the list below of countries in which Huntings have carried out photographic, mapping, ground or geophysical contracts.

I must apologize for the absence of X and Y. On second thoughts I withdraw my apology about X as no country has been thoughtful enough to start its name with that letter, but there is the odd candidate for Y.

The work done in these 80 countries has naturally varied considerably. Among contracts now being carried out by our companies is the watershed management study and aerial survey in connection with the division of the waters of the Indus basin, the subject of the recent treaty between India and Pakistan, and the investigation

into the waterlogging of great areas of farmland in the Sind – described elsewhere in this issue. The importance of these undertakings to millions of people in the years to come can hardly be overstated.

✧ ✧ ✧

ONE OF THE MOST impressive features of the International Photogrammetric Congress held in London in September was the tremendous amount of voluntary hard work put in by wives and daughters of the British delegates who were the hosts. The only draw-back to this sort of thing spreading is that women may come to realize that they are really more efficient than their husbands. On the other hand it may make the latter work harder, and make the excuse of a hard day at the office to avoid the washing-up, really valid.

✧ ✧ ✧

FARNBOROUGH THIS YEAR was the first real occasion when the results of the recent mergers in the aircraft industry were open for inspection, and the stand of Hunting Aircraft Ltd. (in which British Aircraft Corporation now has a controlling interest) formed part of the latter’s large one. Sir George Edwards and Mr. W. Masterton

have joined the board of Hunting Aircraft, which now comprises Sir Percy Hunting, chairman; Sir George Edwards, vice-chairman; Mr. C. P. M. Hunting; Mr. L. C. Hunting; Mr. William Masterton; Mr. W. A. Summers, managing director; Mr. K. D. Morgan, secretary and commercial director; Mr. F. W. Buglass, works director; Mr. F. H. Pollicutt, technical director. Whilst on the subject of Hunting Aircraft, one must also mention the brilliant display given by Flying Training Command’s Jet Provosts.

✧ ✧ ✧

THE OTHER Hunting interest at Farnborough was Field Aircraft Services – now a wholly owned Hunting company. Fields have a remarkably fine export record. Over a five year period, they have averaged £600 worth of exports per employee per year, and this figure is divided almost exactly between dollar and other currencies.

✧ ✧ ✧

BEFORE THE END of the year, the Hunting fleet will have a fifth ship carrying dry cargo. This is m.v. *Duffield*, which has been converted by Smith’s Dock Co. Ltd., from oil carrying to bulk carrying with gear.

## COUNTRIES IN WHICH THE HUNTING SURVEY GROUP HAS OPERATED

Aden, Afghanistan, Alaska,	Dominica,	Malaya, Mauretania,	Southern Rhodesia,
Algeria, Antarctica	Ecuador, Egypt, Ethiopia,	New Zealand, Nigeria,	Somalia, St. Lucia,
(Grahamland), Australia.	Eire.	Northern Rhodesia,	Sudan, Syria.
Bahrein Island, Barbados,	Falkland Islands, Fiji.	Norway, Nyasaland.	Tanganyika, Tasmania,
Bechuanaland, Borneo,	Gambia, Germany, Ghana,	Oman.	Thailand, Trinidad.
British Honduras, British	Greece.	Pakistan, Papua, Peru,	Uganda, Union of South
Guiana, Brazil, Burma.	Haiti, Hong Kong.	Phillippines, Portugal.	Africa, United Kingdom,
Cambodia, Canada, Ceylon,	India, Iran, Iraq, Italy.	Qatar.	United States.
Colombia, Cuba, Costa	Jamaica, Jordan.	Rio de Oro.	Venezuela, Virgin Islands.
Rica, Cyprus.	Kenya, Kuwait.	Sierra Leone, Spain,	Windward Islands.
Dominican Republic,	Leeward Islands, Libya.	South West Africa,	Zanzibar.





# The Latimer Story



Colvilles, Ravenscraig Scotland

*This is the story of a company formed just fifteen years ago, yet already it is one of the biggest of its type in Britain and there can be few people who have not passed a Latimer painted structure at some time or another as they go on their daily round.*

WM. LATIMER & CO. LTD., Painting Contractors, Newcastle upon Tyne, was formed in 1945, and is an associate company of Robert Bowran & Co. Ltd., the paint manufacturers, whose history was given in the issue before last. Latimers is, in fact, the successor to Bowran's own Contracting Department which had been in existence since 1920, and was principally concerned with the application of materials made in the Bowran factories. It was felt that, with the war in Europe drawing to an end, there were advantages in having a separate contracting company, and the first offices were at Pandon Buildings, City Road, Newcastle upon Tyne, with the small staff which had been running the Bowran Contracts Dept. Mr. Dudley F. Whittle, who had been contracts manager of Bowran's for nine years, and a director for two, was appointed managing director of the new company, the other directors being members of the Bowran Board.

The new company under Mr. Whittle's vigorous leadership soon became established, and, from fairly small beginnings a development policy was adopted with a view to operating on a national basis with branches in various parts of Britain.

## Establishing the Branches

To enable the reader to follow this story more easily, a recording of what happened in various parts of the country may help. Administration has always been carried out from Newcastle, and the original office in Pandon Buildings housed a staff of six people. By 1948 it was obvious that fresh premises in Newcastle were wanted. The staff had grown considerably and, with every possibility of further increases, the present Head Office in 10 Archbold Terrace, Newcastle, opened in 1949. Five years later, even after extensions, these premises were inadequate and No 12 Archbold Terrace was bought, followed by, in 1958, No. 8. Over fifty people are now employed in the

secretarial and administrative departments at the headquarters.

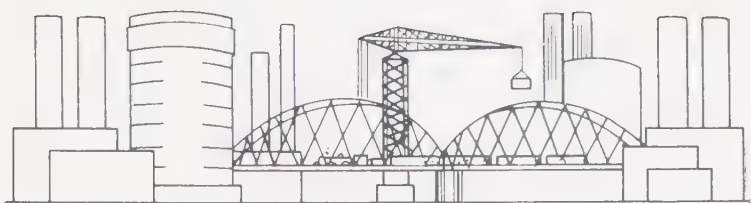
In 1945, Birmingham and Glasgow offices were opened to control contracts in the Midlands and Scotland which had been taken over by the new company. In both cities, the company eventually acquired sites and built its own offices and warehouse accommodation. London office was established at the end of 1945, the branch finally being established at Queenstown Road, Battersea. Meantime, Manchester office was opened in 1946, and since 1954 it has been at Chorlton. Similarly a Leeds branch was started in 1947, and moved to its present site in 1952, where offices and warehouse accommodation are under one roof.

In 1947, the Company secured the contract for the painting of the new Abbey Steelworks for The Steel Company of Wales Ltd., and for some two years a site office at Port Talbot had to meet all the Company's requirements. Work in the area continued to expand and in 1950 premises were opened on the Bridgend Industrial Estate. In 1957, development in the East of Scotland, particularly in the Fife area, was such that an eighth branch was opened at Alloa. From these branches the whole of the company's activities throughout the United Kingdom and in Northern Ireland are organized and serviced.

## The Management Team

Today, the name of Latimer is well-known in connection with all types of industrial paintings and the amount of work carried out annually is over twelve times as great as compared to the first year after the war, and much more varied. The success of the Company has been due to the building up over the years of an enthusiastic and capable management team, and the history of this team in itself, is a story.

In 1945, Whittle had with him James Tomlinson who had joined Bowran's



## LATIMERS MANAGEMENT TEAM

Contracts Department in 1937. Tomlinson was elected to the Board of Latimers in 1957, and they are still working together, sharing the responsibility of directing the Company's activities. John Collins joined Bowrans in 1939, transferred to Latimers in 1945, and was elected a member of the Board last year. Collins is principally concerned with the direction of the Company's affairs in the Midlands, Southern England and South Wales. Edwin Richmond, who had started as a very young man with Bowrans in 1920, transferred to Latimers in 1945 as Cashier and was appointed Secretary in the Company in 1954 – forty years of loyal service. The Cardew brothers of South Shields, Frank and Fred, joined Bowrans Contracts Department in 1936, transferred to Latimers in 1945, and today Frank, who was appointed a local Director in 1954, is in charge of all work in the four Northern counties and is responsible for the company's marine work in all parts of the United Kingdom. Fred is Manager of the Birmingham branch. Harold Jones, another Tynesider, began with Bowrans at the same time and since 1946 has been manager of the Manchester branch. Such men as these have gained and maintained the confidence of some of the firm's principal customers over many years.

During the first few years of the new company the recruiting of additional staff was one of the main problems, and the Company had mixed fortunes.

In 1947, John Wynne who had had a distinguished career in the Royal Air Force, joined the company as Scottish Manager and development in Scotland proceeded very satisfactorily. With his death in 1955, the Company sustained a severe loss, although fortunately John Hunter, who had been with the company since its formation and was assistant to Wynne, was able to take over. Today, he manages the Company affairs in Scotland. Management problems in London were numerous, but in 1950, Bill Allchin, who had served throughout the Burma Campaign, and in Malaya, and was still an enthusiastic Territorial Officer, joined the company. It



*Top, left to right: D. F. Whittle, J. Tomlinson, J. A. Collins, G. E. Richmond  
Centre, left to right: H. Jones, E. Fearnside, F. J. Cardew, J. Hunter  
Bottom, left to right: R. M. Heffer, T. H. Evans, F. G. Cardew, J. W. Moorhead*

was a great shock to all his colleagues when he died suddenly in 1958, at the early age of forty-two. Eric Fearnside, after five years in a German prisoner-of-war camp, joined Latimers in 1946, and as a Yorkshireman was the obvious choice to take charge of the Leeds branch when this opened. Howard Evans is the most recent signing, having joined the company as Manager for South Wales in 1957, with many years experience in the industry – a typical Welshman working happily in his native valleys. John Moorhead joined the

Company straight from school in 1951 at sixteen, and he has managed the Alloa office since 1958. A clear indication that opportunity still exists for those with ability in a progressive company.

The success of the Company has in a large measure been due to the excellent team spirit which prevails, and the opportunity for progress – a number of the senior staff originally started with the Company as office boys. John Whyte, chief estimator, Derek Grassie, his assistant, Alan Vinton, Supervisor of contracts in the North of



England, and Eric McDonald, chief clerk, are all examples.

The relations between staff and work people since the company was formed have always been excellent, and Latimers have never been involved in an industrial dispute.

A working staff of several hundred is employed throughout the year, and during the summer months this is supplemented as the need arises. Contracts extend at times from Devon and Cornwall to the North of Scotland, so the supervision of the work

RIGHT: *Turbine Room, Cliff Quay Power Station, Ipswich*

BELOW, RIGHT: *Goliath Crane, Hunterston Nuclear Power Station, Ayrshire*



*Royal Box, Grand Theatre, Leeds*

involves many of the senior staff travelling considerable distances and being available seven days a week. Once again, only a good team could stand up to the varying demands made by the Company's clients.

#### Some Important Contracts

Latimers have always specialized in the painting of industrial buildings and plant: power stations, gasworks, steelworks, dock installations, oil refineries, and the like. Work has been carried out for government departments, nationalized industries and local authorities and the sign 'Painting by Latimer' has been on display at some time or another in practically every county in England, Wales and Scotland. Contracts include London bridges such as Westminster, Hammersmith, Albert and Barnes; Manchester railway stations – Central, Victoria, and Exchange; piers such as Southend and Hastings; the Princes Landing Stage, Liverpool (painted for the first time after the war for the welcome home of the King and Queen after their Canadian tour in 1947); bridges over the Tyne; and installations on the North East Coast, Merseyside, the Clyde and South Wales.

In the early years after the war, before industry got into its stride and capital







*Westminster Bridge, centre of the Commonwealth, is one of the many bridges in London painted by Latimers, including Barnes and Hammersmith of 'Boat Race' fame*

Summers & Sons Ltd., and has had men working in the steelworks at Scunthorpe for the entire period.

From the foregoing, it might be assumed that the Company is only concerned with the protection of steelwork and buildings associated with heavy industries, but work is also undertaken in all types of industrial premises such as sugar beet factories, flour mills and engineering shops, and in this field the importance attached to planned colour in painting schemes both by factory owners and H.M. inspectors of factories has provided a lot of work.

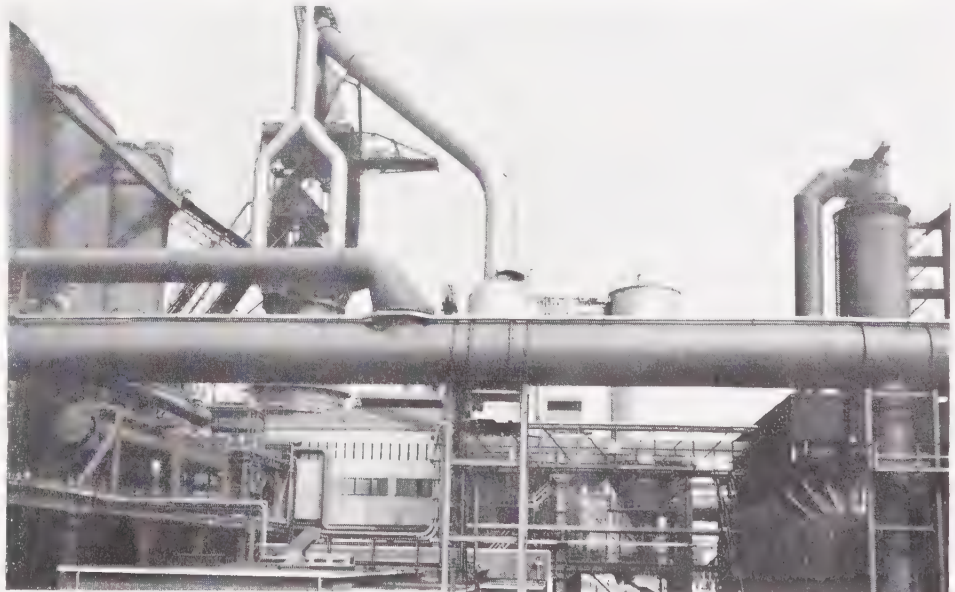
was available for development, the Company was principally employed on the repainting of existing buildings which had suffered from their enforced neglect and through being blacked out during the war. The Company was successful in securing a share of the painting of the new power stations which were being built throughout the country. (The reader will recall in the late 40's the many black outs experienced because of power shortages). Since those days, work has been carried out in well over fifty power stations, and in some cases Latimers have been entrusted with the complete painting work, involving contracts varying between £50,000 and £100,000. Everyone is familiar with the pylons of the Central Electricity Generating Board which cover the country. Year in and year out, in some part of the United Kingdom, Latimer's are painting these pylons, and this year squads have been working from Fifeshire in the north, through the North of England and the Midlands, to Kent in the south. Weather conditions create many difficulties when dealing with this type of work, and the organization of the work for squads of men in remote areas is not a simple matter.

Latimers have always been closely associated with the steel industry and has squads working continuously in most of the steel producing centres. It is interesting to know that starting with a small contract carried out by Bowran's Contracts Department, for Colvilles, the Scottish Steel Makers in 1934, the association has been continuous and the Company recently completed the painting of the new Ravenscraig Steelworks at Motherwell, one of the largest industrial projects in Scotland. As has been previously mentioned, Latimers secured the contract for the painting of the new Abbey Works of The Steel Company of Wales Limited, and have been continuously employed ever since in the 'City of Steel'. The Company has had an unbroken association with the vast development of the Hawarden Bridge Steelworks of John



*ABOVE: Steel Co. of Wales, No. 5 Blast Furnace, in process of painting*

*BELOW: Steel Co. of Wales, Blast Furnace Plant, after painting*







ABOVE: Goliath Crane, Vickers Armstrong, Naval Yard, Walker-on-Tyne



BELOW: Hawthorn Leslie's, Hebburn-on-Tyne

## A Royal Occasion

The company does a small amount of decorative work, generally where this ties up (offices, canteens, etc.) with industrial contracts and certain clients. The Leeds branch has always, however, undertaken a small amount of high class decoration, and it was a proud day in the Company's history when it was entrusted with the complete decoration of the Royal Box and Reception Rooms at the Grand Theatre, Leeds, on the occasion of the Queen's visit to Leeds for the Musical Festival in 1958.

On the marine side, the Company paints plant and structures at shipyards, and during the past couple of years has been very active coating ships' tanks with the new 'Epikote' materials.

It is sometimes recalled with amusement, that when the Company started, it was the proud possessor of two well-worn motor cars, one decrepit van and a few bicycles. Today, there are over sixty Latimer vehicles on the roads, ranging from thirty seater buses, to five cwt. vans.

To the man in the street, industrial painting is something of a mystery. He thinks of painters as a nuisance when his wife decides that the house requires decoration. The application of paint is only a part, and often by no means the biggest part, of Latimer painting operations. The success of any paint system depends to a great measure on surface preparation, and the Company employs all methods of mechanical cleaning in its efforts to achieve success and satisfied clients. Costly equipment, such as compressed air for shot blasting, oxy-acetylene plant for flame cleaning, mechanical wire brushes etc. is in constant use, and chemists and technicians are regularly consulted to assist in the battle against corrosion which costs the country millions of pounds per year.

Over the years, Latimers have reached the front rank of painting contractors, and 'Painting by Latimer' it is hoped will always give satisfaction.

John Summers & Sons Ltd., Hawarden Steel Works, N. Wales





# Group News

✦ CANADIAN APPOINTMENTS ✦ PAINT PROTECTS PIPE LINES

✦ NEWS FROM OVERSEAS ✦ G. L. HUNTING GOLF SHIELD

✦ NEW DEVELOPMENT REVEALED AT PHOTOGRAMMETRIC CONGRESS

✦ IN SERVICE WITH ROYAL DANISH AIR FORCE

✦ HUNTING SURVEY (HOLDINGS) LTD

## Canadian Appointments

As reported earlier this year, the newly formed Hunting Survey Corporation Limited of Toronto combines the functions of the three companies formerly known as The Photographic Survey Corporation Limited, Hunting Airborne Geophysics Limited and Hunting Technical & Exploration Services Limited.

The board of directors of Hunting Survey Corporation is as follows:

D. N. Kendall, President; W. H. Godfrey, Vice-Pres.; D. G. MacKay, General Manager; J. G. Wilkinson, Technical Director; M. E. Dedrick, Secretary; J. M. Henderson, J. R. Hughes, E. W. I. Keenleyside, and P. F. Osler.

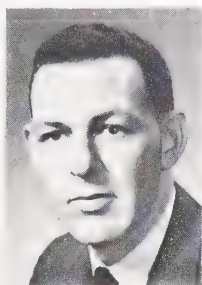
Mr. W. H. Godfrey, in his capacity as Director – Marketing, is responsible for the entire Group Sales effort with Mr. Al Brown as his assistant co-ordinating domestic sales. Mr. J. M. Henderson, the most recent member of the Board of Directors of H.S.C., and a member of the Marketing Division, is concerned with the developments of Foreign Aid programmes. He maintains liaison with the United Nations, the Canadian Colombo Plan and the International Co-operation Administration authorities.

Mr. D. A. MacFadyen is responsible for Sales and Operations in Latin America.

Mr. D. N. Kendall, Vice-President of Hunting Associates Limited, also announces the appointment of Mr. Victor Koby as General Manager of Field Aviation Company Limited, and his election to the board of directors of that company.

Mr. Koby joined Hunting Associates in 1959 and before joining the Group was associated with aviation in Canada for a number of years. He is a graduate of the University of Western Ontario and the London School of Economics.

*Vic Koby*



## Paint Protects Pipe Lines

By permission of the North of Scotland Hydro Electric Board we reproduce this picture of the Loch Sloy pipe lines, which were painted in 1950, in common with many other of the Board's works, with Bowran Paints. For the last ten years peaty water has flowed harmlessly to the turbines through the pipes – fifteen hundred feet long and seven ft. in diameter. The metal is protected from corrosion, inside and out, by Bowran products.

The internal scheme is still in good order, and only now, after ten years wear and tear from the elements, has the external work become due for renewal. Bowran paints have again been chosen for the work (painting by Latimer). In addition to being used on the pipe lines, the Company's paints were also used in 1950 to protect the water contact surfaces of the Loch Sloy Dam. The paint is still in good condition.

## News from Overseas

We have recently received some interesting notes on the work of Field Aircraft Services Africa Ltd. which gives a good idea of the present scope of their operations with the exception of their flourishing Agency work which is not covered.

At Germiston their engineering division is sub-divided into two sections – engines and air-frames. The first includes all aspects of engine, propeller and component overhaul and also houses the electrical and electro-plating sub-sections, whilst the airframes section is engaged primarily on airframe maintenance and overhaul and also embraces the sheet metal and welding shops.

In any business it is always pleasant to have a contract renewed, and Fields has been re-awarded the S.A.A.F. contract, which they had held for two and a half years, for the overhaul of P & W R1830



and R1340 engines as well as for minor and major inspections of Dakota aircraft.

New contracts include the overhaul and repair of sheet metal components from Harvard, Dakota and Sabre aircraft; and also the minor and major inspections of Harvard aircraft.

Civil customers include the Anglo-American Corporation; the Aircraft Operating Company; the South African Iron & Steel Co.; and Trek Airways.

At Salisbury, the Rhodesian Engine Division specializes in the overhaul (some eleven types) of engines, propellers and components. It holds current contracts with the R.R.A.F. for R1830 and Leonides engine overhauls. This division also does

## FAMILY ALBUM 1

### Boris Reford

BORIS REFOR was born thirty two years ago in Montreal, where he now manages E. A. Gibson & Reford Ltd. He received his earlier schooling in this same town and from here he went to Trinity College, School at Port Hope in Ontario.

Later Reford joined the Royal Canadian Naval College as a cadet, and after graduation joined his father's firm (The Robert Reford Co. Ltd.) prior to his going to New College, Oxford, where he took a degree in Modern History. It was at Oxford that he was introduced to rowing where he reached his college second eight.

he worked in the dry cargo department until towards the end of 1956. In this department he had his introduction into the mysteries of the chartering business, and got a good solid basic training.

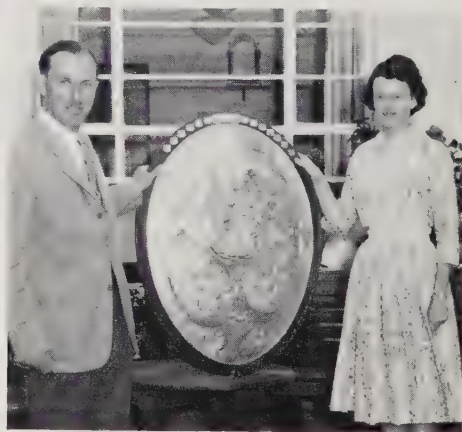
The family business again claimed his attention for the next two years where he was responsible for handling tramp agencies, as well as being secretary of the company.

It was at the beginning of 1959 that E. A. Gibson & Reford was established and it was on the opening of these offices that Reford assumed his present position. It is his hope that Montreal, while obviously never going to challenge London or New York in this field, will gradually develop into a centre of some importance in the ship-broking world, and that Canadian cargoes will be generally fixed through a Canadian outlet.

Besides shipbroking Reford's interests in life include reading, flying, fishing and shooting. In winter he is generally to be found skiing in the Laurentian Mountains.

### G. L. Hunting Golf Shield

Miss Mary Gatheral and Mr. Pat Hunting with the G. L. Hunting golf shield which they won for Norwich House at the Annual Meeting at Ashridge. Their score was 4-up on bogey as was that of Miss Robinson and Miss Waugh (Northern Petroleum), the score over the last nine holes being decisive.



## FAMILY ALBUM 2

### Captain M. E. Friskney

MARSHALL ERNEST FRISKNEY joined Huntings in 1938 as 3rd Officer, and was promoted to Master in 1943. Previously he was apprenticed to the Hain Steamship Company with which he served until joining the Hunting Group.

Friskney was born in Redcar in 1916, and was educated at Coatham Church School and Coatham Grammar School.

During the war he served on the *Oilfield*, *Wearfield* and *Empire Unity* mostly in



*Work in progress, instrument section, Field's Instrument & Electrical Division, Salisbury*

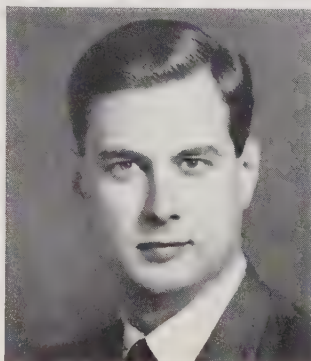
most of the overhauls for air charter companies, private owners, the Northern Rhodesian Government, the Portuguese authorities and the Desert Locust Survey, Nairobi.

The engine division is, of course, at the airport, but the instrument and electrical division is in Market House in Salisbury itself. It is the only business of its kind in the Federation and, consequently, is handling most of the work in the aviation field, including the various work on instrument and electrical components from the R.R.A.F. fleet of Provosts, Pembrokes, Dakotas, Vampires, Canberras and Argonauts.

Recently, too, the Company has entered the industrial field, and instruments such as temperature recorders and controllers are being handled.

Returning to Montreal in 1950 he again went back into the family firm which is a liner and tramp agency business, and there he learnt the ins and outs of the trade.

Back in England in the summer of 1955 he joined E. A. Gibson & Co. Ltd., where



*Boris Reford*





Captain  
M. E.  
Friskney

Atlantic convoys. When the *Oilfield* was lost through enemy action he was awarded a Vellum by the Royal Humane Society for helping a non-swimmer until he was picked up by a rescue vessel.

After the invasion of Europe he took petrol on the *Empire Unity* from the River Thames to Antwerp, and was afterwards presented with the Chevalier of the Order of Leopold and Croix de Guerre. *Empire Unity* was one of the first vessels to enter Antwerp after the liberation of Belgium.

Friskney was again torpedoed on the *Empire Unity* a few days prior to VE day.

He now lives in South Shields and is married, with a son and teenage daughter. Most of his leave is spent river fishing and motoring.

### New Development Revealed at Photogrammetric Congress

Final figures show that a thousand delegates from sixty countries attended the ninth international photogrammetric congress held in London in September with the object of studying mapping and surveying on a world-wide basis and also new methods and equipment. Latest examples of mapping instruments costing up to £20,000 each were on display with particularly fine exhibits from Switzerland, Germany, Italy and the United States.

General R. L. Brown, the Congress President, described one new development in particular as the most important discussed at the meeting. This was a new device known as the Stereomat, which, through the use of electronics, brings automation to the complex plotting instruments, which had relied up to now on the human operator. Use of the Stereomat will mean that maps can be produced from the instruments at speeds and accuracies greatly in excess of a human operator's capacity.

The Stereomat has been developed by the research division of the Canadian Hunting Group, a part of the British Hunting organization. The American army and air force are showing great interest in it, and Mr. G. L. Hobrough of Canadian Hunting's research division, will be developing his invention in co-operation with

the American forces and other interests, including the Benson Lehner Corporation of Los Angeles, who will be manufacturing the equipment in the United States. The Stereomat will be made available throughout the world.

### FAMILY ALBUM 3

#### S. H. Evans

SELWYN HOWARD EVANS, forty years of age, is general manager of Field Aircraft Services Africa Ltd. and is on the board of both the Field South African and Rhodesian companies.

A Welshman, as one might guess by the name, his technical career started with his enlistment into the Royal Air Force at the



S. H. Evans

start of the last war. In the Service, he was mustered at one time or another as flight mechanic; flight engineer; wireless operator/air gunner; and finally as pilot.

In the first role mentioned, Evans was stationed at Biggin Hill with 32 Fighter Squadron, and he was posted from there to the Empire Flying Training Scheme in South Africa, where he completed Elementary and Service F.T.S. training as a pilot.

Upon leaving there, while en route to Canada for Master Navigator training, he had the misfortune to force-land in the desert near El Adem, so that his eventual arrival in England coincided with V.E. day. Thereupon all aircrew under training became redundant, and the rest of his Service career was spent as N.C.O. i/c Rolls Royce Engine Division at St. Athans, near Cardiff.

Returning to South Africa in 1946, he joined Airservice (which was later to become Field's), his appointed task being to develop an engine overhaul shop. This duly accomplished, and with the Division well established over a ten year period, he was asked in 1956 to give a repeat performance in Rhodesia and, together with his colleague Stan Evans, inaugurated the Rhodesian Engine Division.

Of this division Stan assumed office as Works Manager coinciding with Evans' appointment as General Manager in January 1959.

Later in 1959 a decision was made to establish the Rhodesian Instrument and Electrical Division which, after a year's operation, is progressing very satisfactorily.

His job in life now is to 'hover' between the two Salisbury Divisions and Germiston.

Evans' hobbies are photography and gardening. He played rugby for the S.A.A.F. and R.A.F., but says he is now too old; he also enjoys swimming. He is married and has three boys.

Since Evans' appointment to General Managership eighteen months ago he has travelled some 75,000 miles on business trips to the Belgian Congo, Angola, Tanganyika, East Africa, United Kingdom, U.S.A. - and between Salisbury and Germiston.

#### D. G. Lee Joins Field's Board

Field Aircraft Services Limited have appointed Mr. Derek Lee, Commercial Manager, to the Board as Sales Director. Mr. Lee has been with Fields since 1944, after having served with the Royal Air Force. As Commercial Manager he has done much travelling overseas for the company and has been closely concerned with all Field's major projects over the past decade. 39 years of age, Mr. Lee is married with an only son.

#### In Service with the Royal Danish Air Force complete with Hennessy

Fido, a St. Bernard puppy, and seen here with traditional trade mark of his species, was presented to the Royal Danish Air Force Pembroke Squadron by Hunting Aircraft, the designers and manufacturers of the aircraft. Fido is a particularly suitable mascot since the squadron is concerned with sea-air rescue.



#### Hunting Surveys (Holdings) Ltd.

At a Board Meeting of this Company, held on the 19th September, Mr. T. D. Weatherhead and Mr. D. N. Kendall were appointed Directors.





## Leadenhall Street

BY W. H. GREEN

*(Mr. Green heads the Gibson oil interests in Canada and has been with the Hunting Group for forty-five years).*

FIVE YEARS AGO I wrote an article for the Winter issue of the *Group Review*, describing E. A. Gibson & Company Limited's first adventure on the continent of the Americas. This, however, only represented their initial step in that direction, and today a truer caption would be 'Leadenhall Street to Canada' as their activities have spread to cover five out of the ten provinces across this great country. Five companies are actively operating there with the name of Gibson incorporated in their title, four of them located in Calgary, Alberta, in the oil business, and the fifth in Montreal, Quebec, where they are engaged in the shipping business, concentrating on International, the St. Lawrence Seaway and Lakes trading. Except for one of the Calgary Companies and the Montreal company we have as partners with us members of the Guinness family and Charles R. Weber of New York, who, in their separate ways have very largely contributed to the expansion and success of our operations in Canada. The Guinness interests have added a tremendous strength to our standing in Canada where they have been established for many years, particularly in Vancouver which they did so much to develop. Charles R. Weber has been associated with Gibsons for many years as their New York correspondent, and has been an important link with the American Oil Companies operating in Canada who have entrusted us with the disposal of their Canadian production.

The Canadian oil industry in which we

are interested is, of course, still in its infancy, and even though it is now more than ten years since a real start was made in developing its oil resources, the latest statistics show that it still only produces around 550,000 barrels a day despite its ability to produce according to conservative engineering practice, double that figure. The problem of vast distances and high costs accounts for the fact that although Canada consumes approximately 25 million barrels of crude oil and its products every month, less than half of this comes from domestic sources. Most of the imported crude and products enter the Eastern Canadian market which lies some 2,500 miles from the main source of the existing Canadian supplies, but as the volume of consumption increases, Canadian producers are enjoying, and will continue to enjoy, a greater proportion of their own domestic trade, thus effecting lower transport costs because of the increased volume which will gradually narrow the gap between the cost of imported crude and Canadian crude in the principal areas of consumption.

The oil potentials of Canada are still largely unexplored, although during the next five years there are plans already in operation to develop what are believed to be extensive oil pools in the North West Territories. It can rightly be said that these resources, as yet undeveloped, remain in Canada as one of the major reserves for the forces of freedom not only in North America, but in other parts of the world,



# to Alberta



## Gibsons' Achievements

Gibsons can be proud of the fact that they have participated in the present restricted growth of from less than 100,000 barrels a day in 1950, to the present level of over half a million barrels, and have been instrumental in overcoming uneconomical transportation costs and establishing outlets for quite an important percentage of crude oil now produced. In this connection Gibsons substantially increased market outlets for two fields in Saskatchewan known as Weyburn and Midale as a result of a contract negotiated with Canadian Oil Companies Ltd. for 11,000,000 barrels to be delivered into their refinery at Sarnia. Previously little more than 25% of the field's capacity was being disposed of. Pipeline transportation costs were materially reduced and now producers in those fields are enjoying a market availability for more than 70% of their estimated capacity – in fact the Midale Field has already reached the limit of its production except for a few wells capable of more than their prorated allocation of market demand.

In the winter issue of the 1955 Group Review mention was made of the first invoice issued by Gibsons for only 365 barrels being their total sales in the month of August 1953, and this can now be compared with the invoices issued in August 1960 for 1,150,000 barrels which they purchased at the wellhead and delivered into domestic consumption by tank truck, railway tank car and pipeline. The average

tank truck only carries 50-80 barrels, and railway tank car capacities range from 190-240 barrels, so it takes little imagination to appreciate the extent of the organization, and the number of transactions involved in the movement of such a large quantity of oil, even if only 25% is handled by trucks and railway tank cars.

## How Gibsons Operate

Questions have often been asked 'What do Gibsons do in Canada?' and 'How do they operate?' They can be answered best by outlining how some of their transactions start and are processed. They invariably start as a result of a well being drilled in an entirely new area that can generally be termed as 'wild cat'. Frequently it is well off the beaten track – right out in the wilds away from habitation, and many miles from any pipeline facilities. As soon as the oil Company concerned has established that they have discovered oil, we either contact them, or they contact us with the object of arranging for the production to be moved into consumption. Having ascertained the type and grade of crude oil produced, steps are taken immediately to find the nearest refinery or pipeline injection point, where the oil would be acceptable, and the price it would realize. As soon as an outlet has been established a Field Superintendent is instructed to make a trial run to check road and terrain conditions, and distances in order to work out transportation costs.

As mentioned previously, such a well is

often far from habitation and the only way to find it is to have what is known as the L.S.D. description of its location which gives the Legal Subdivision, Section, Number, Township Number and Range west of a specific Meridian enabling the Superintendent to pin point the position of the well in the same way as a ship's Captain can pin point his vessel's position on a chart. After obtaining his report of road conditions, distances, etc. the producing company is advised what can be paid for the oil at wellhead, and assuming they are satisfied, tank trucks begin to roll in on a regular scheduled basis, frequently working on a 24 hour programme. Due to climatic conditions it is often necessary to work only at night when the frost has hardened the surface sufficiently to take the weight of the loaded trucks. This applies particularly when there is no real road to traverse but just a track across the open countryside and stretches of muskeg, which is so often the case in the northern parts. Perhaps it should be mentioned here that much of our oil is moved in the winter with temperatures as low as 30 degrees below zero, and even -40 degrees.

Normally a successful well automatically leads to further wells being drilled, and facilities are built up depending on the measure of success met with in the additional drilling. As soon as the volume of production warrants pipeline engineers are instructed to prepare estimates involving on the ground, and in some cases air survey, to select the most practical and economical





*Part of Gibson Associated Oils Ltd.'s crude oil storage installation at Hardisty, Alberta, through which more than a million barrels of oil are handled annually*

routing to the nearest point of consumption or into a main pipeline stream. From then on it is only a matter of time for one or more oilfields to be connected to the thousands of miles of pipelines now crisscrossing Canada to ensure the movement of production 365 days in the year.

Of course, not all refineries are tied into pipeline systems, and they have to rely on crude oil supplies being delivered into their plants by rail tank cars which are loaded at points close to the fields either by pipeline or road truck. Gibsons have successfully maintained such supplies to at least two refineries for several years. Operations of this kind are not the most efficient, and either the producer suffers low returns, or the refiner high costs, affecting their respective net back. This was the situation as regards the Husky Oil & Refining Company's refinery at Fort William at the head of Lake Superior, but after many months of investigation and negotiations Gibsons succeeded in working out arrangements for the refinery to be supplied with crude oil delivered from Saskatchewan Fields to the port of Superior, by the Interprovincial Pipeline, and shipped from there to Fort William by a 29,000 barrel lake tanker. More than 300,000 barrels were delivered into this refinery by that method during August replacing more than 150 rail tank cars. The higher rate of delivery, and the build up of winter stock necessitated Huskys building an additional six 80,000 barrel storage tanks, and work was started on this early in the spring of 1960. All these tanks will be completed and in service before the end of October permitting a stock of more than 600,000 barrels to be carried and Gibsons will have every tank full, as well as supplying the refinery's day-to-day requirements in the meantime, before Lake Superior freezes up and the tanker with-

drawn to warmer waters. Needless to say, both the producer and the refiner benefited by this more efficient method of handling.

#### **Pipeline Facilities**

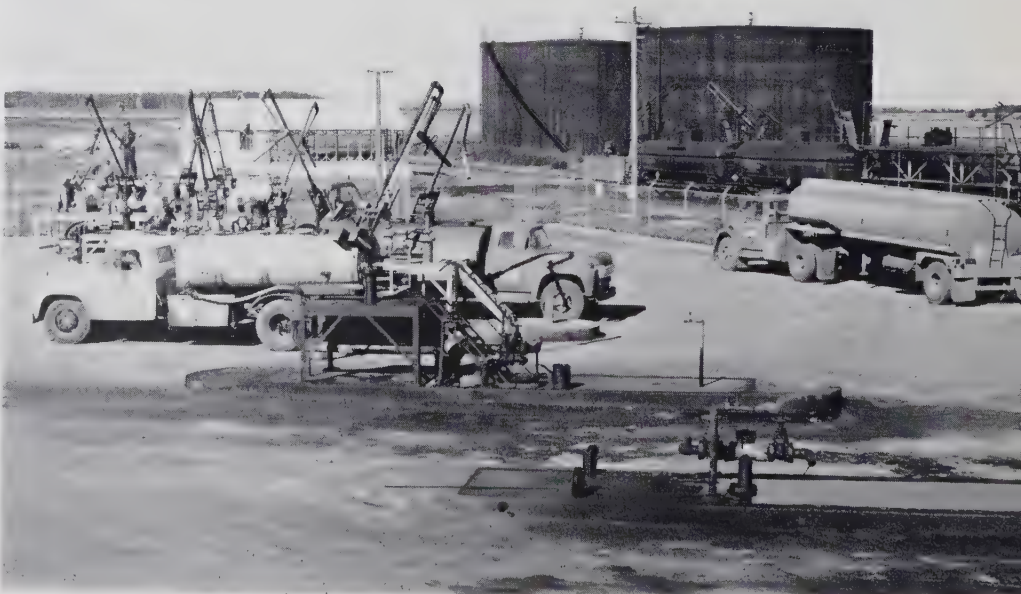
Little has so far been said about our pipeline facilities. Gibsons now own and operate five gathering systems, and feeder pipelines with a total length of nearly 100 miles as well as several small tank installations. Three of these systems act as feeder lines to major company operated pipelines so that oil gathered by us in the fields served is finally delivered or can be delivered, into refineries as far as Toronto in the East, and Vancouver in the West. Our largest system gathers oil in the Bellshill and Thompson Lake areas in Alberta and is connected to about 100 wells

from which they are purchasing as much as 4,000 barrels a day. This oil is pumped into their Tank Farm at Hardisty until 30,000-40,000 barrels are accumulated when arrangements are made to inject the oil into the Interprovincial Pipeline for transmission to Sarnia or other points in the East. As soon as the market is available our throughput can be stepped up to 8,000 barrels a day without any further equipment and the pipeline itself has a capacity for handling as much as 15,000 barrels a day. Being so closely associated with the shipping business one cannot help but compare a pipeline operation with that of an ocean tanker inasmuch as the pipeline is simply a method of transporting oil in bulk across land in the same way as a tanker transports oil cargoes in bulk across the oceans. The



*The Lake tanker 'River Transport' chartered by Gibson Petroleum Company Limited through E. A. Gibson & Reford Ltd. discharging one of the first cargoes of crude oil delivered to the Husky Oil & Refining Company's plant at Fort William, Ontario. Two of the storage tanks in the background were still in course of construction when this picture was taken*

*The Grande Prairie railway siding where Gibson Crude Oil tank cars are unloaded into the storage tanks in the background, with road tank truck loading and discharging facilities in the foreground*







*Picture taken from the bridge of the 'River Transport' while discharging into one of the six 80,000 barrel storage tanks being constructed at Husky's Fort William refinery. The three painted tanks on the right were the original crude oil tanks, and the tank farm will now have a capacity of over 600,000 barrels*

*The North Star Oil Ltd., refinery at Grande Prairie, Alberta, which draws its supplies of crude oil from Gibson Petroleum Company Limited who effect delivery by both road tank trucks and railway tank cars*

Bellshill Thompson Lake Hardisty pipeline handles the equivalent of twelve T-2 cargoes a year at its present rate of throughput.

Two systems that are not connected to main pipelines, terminate at railway sidings where the oil gathered in the field is pumped into tank cars and dispatched direct to refineries. One of these systems is located at a place called Normandville, which as the name denotes, is of French origin. The story is told that when we sent our first representative to look over the ground he had great difficulty in making himself understood as French was still the only language used in that area – a relic of the days when Canada passed from France to Britain and many French families moved out to the west setting up small communities such as we have in Normandville.





The Gibson companies in Canada are basically the same as Gibsons in London in that they are primarily service companies to the oil industry, and as such are always seeking out ways and means of justifying their place in the oil business. They proved themselves in London as an essential and integral part of the oil industry in the International Trade, and it is now acknowledged in Canada that they are performing an essential service there. The Country is still very new with thousands of square miles of wide open spaces sparsely populated, and this makes rapid expansion difficult. Nevertheless, opportunities are plentiful and there is ample room for new ideas and new approaches to the various problems that are constantly being faced by the oil industry. The recent development of petroleum natural gas has opened up new possibilities of usefully employing the knowledge and experience accumulated by our Group over the last 60-70 years. Production of natural gas has resulted in a tremendous build-up of petroleum condensate, a very light oil with a gravity close to that of gasoline, which is surplus to the market requirements in Canada. On the other hand there are many small fields that produce very heavy asphaltic type crude that in its original form is unacceptable to the main pipelines for transmission to the East where there is a demand for that type of oil. As a consequence refineries in the East have at times had to turn to imported oil for the manufacture of bitumen products while a suitable type of oil in Canada is shut in. A blend of condensate and this shut in heavy asphaltic crude would be acceptable to the pipelines, and Gibsons are planning the necessary facilities to meet the situation, and take one more step to facilitate the consumption of Canadian crude in the domestic trade.

#### Natural Gas

In common with the rest of the world Canada is anticipating a continuing expansion of her oil trade, and is looking to the many chemical plants, that are either building or are already passed the blue print stage to absorb large quantities of natural gas and petroleum products in one form or another. Here again, there are many opportunities in assisting in the development of natural gas production so closely associated with oil, and the Gibson organization will undoubtedly be joining the many other companies operating in Canada to further this comparatively new industry. The Canadian Petroleum Association recently issued a paper in which they forecast 'that the industry will spend about 7.13 billion dollars during the nine years, 1960-68, on exploration, development, production costs, royalty payments and gas utilization.' They further stated: 'This gas expansion will create scores of thousands of



*Sarnia refinery's new Unifiner went on stream in 1959 with the opening of this valve. The new unit provides greater flexibility in processing various types of crude oil and made it possible to operate on medium gravity Saskatchewan Crude which Gibson Petroleum contracted to supply at the rate of 10,000 to 15,000 barrels per day for a total of 11,000,000 barrels*

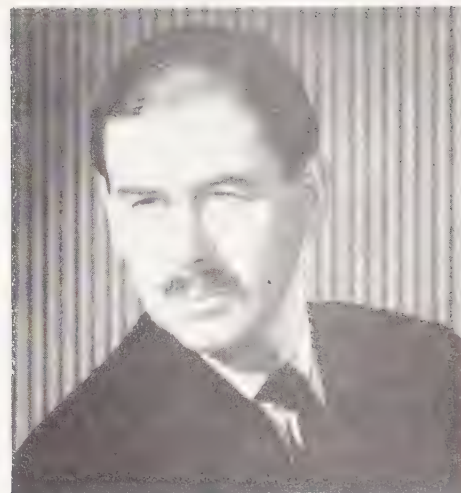
new jobs, and support the continuance of an even larger number of existing jobs in production, processing, transportation and the distribution of natural gas, and in a host of Canadian manufacturing industries directly related to these fields or providing consumer goods to the growing mass of customers. Gas expansion in the next decade will call for very large capital investment to complete links between fields and ultimate consumers creating opportunity for sound investment for a host of Canadians as well as foreign investors in the future of our nation. Increasing availability of gas at reasonable costs will add to the comfort and convenience of millions of Canadians, and both as a fuel and as a raw material it will stimulate diverse industrial development across most of the nation. With a major lift from gas productions, oil and gas royalty payments, mostly to such provincial governments as Alberta, British Columbia and Saskat-

chewan will double, it is expected, during the 60's to more than a hundred million dollars yearly. Rentals and bonuses paid on oil and gas mineral rights will reach even higher levels from income and property taxes levied upon producers, transporters, and distributors of gas. The federal, provincial and municipal governments in Canada will draw increasing returns running into many millions of dollars annually.'

Alberta produces a good deal of Sulphur Gas, and the Canadian Petroleum Association estimates production of Sulphur in that province should reach two million tons annually when all the proposed pipeline projects are completed. Even at this early stage of development Alberta is currently producing Sulphur at the rate of 238,644 short tons annually – just another product closely associated with the oil and chemical trade that will be finding its way into the world markets.

# Collecting Modern Pictures

BY BOULENC



*Boulenc. Photograph by Angus McBean*

*Boulenc, a modern painter, and Delacroix, a painter from the past, have an imaginary conversation discussing the value of being able to recognize the sincere from the bogus in the paintings of today*

AS A PAINTER, I am asked 'What qualities in a picture would you look for in order to make a worthwhile collection of contemporary artists work?' This is a tremendous question and is usually asked by people who know little about art, but who want to start to take a real interest in the pictures which appeal to them. In a few words it is only possible to throw out a few suggestions for would-be collectors to follow. The first principle seems clear, that you should collect and hang on your walls pictures which you are automatically attracted to; then you can start to analyse them, reading or finding out about the artists who painted them. For it is certain that the more you learn about artists and the art of those who influenced them, the easier it will be to understand pictures, and to allow the artist to communicate with you.

To start with, try and keep an open mind and do not be too ready to dismiss a picture as rubbish if you do not immediately obtain a message from it; bear in mind that you do not consider a book written in a language that you do not know as nonsense. You admit that if you want to give an opinion about it, you will have to learn the language first.

Do not be put off by the controversies which rage about 'Modern Art', remember that new things are strange, and the art of many masters of the past was at some time received with hostility, and the artists themselves thought of as complete charlatans or lunatics.

The following is an extract from a notebook belonging to Delacroix:

'The first quality in a picture is to be a delight for the eyes. This does not mean that there need be no sense in it; it is like poetry which, if it offend the ear, all the

sense in the world will not save it from being bad. They speak of (having an ear) for music: not every eye is fit to taste the subtle joys of painting.

The eyes of many people are dull or false; they see objects literally, of the exquisite they see nothing.'

This was the last comment in his journal on June the 22nd 1861. Delacroix died in August the same year.

Many people will voice the same sentiments about pictures today, nearly a hundred years after Delacroix finished his famous journal.

When considering art, especially the art of painting, it is essential to realize that art is by its very nature a living thing, which is always extending its limbs towards new thought, and frequently does so with amazing prophetic accuracy.

Painters, together with other artists, are constantly modifying or revolutionizing their techniques, so as to keep in touch with that section of the public with whom they wish to communicate; though there is less concern as a general rule by the original creative artist to consciously communicate, for he is a natural explorer, who will journey alone if necessary, trusting that he will be able to satisfy his own impelling need to conquer new lands. For him the making of a living, by his occupation is usually a secondary consideration.

Yet it appears that however original or revolutionary these artists may seem at first sight, they have one great quality in common, that of a profound respect for the work of their predecessors and this normally ensures that somewhere in their work there is an element of tradition.

Delacroix whose adoration of Rubens and Titian and admiration of Constable is

well known, was also greatly influenced by poetry and music; I have found that to live the full and desirable life, a mind must be filled with these arts so that each art merges into the other.

In my imagination, I converse with Delacroix, as in him I find an artist who, if he had been able to prolong his life so as to be with us today, would be most likely to share with me a general philosophy on art. In order to try and restrict the conversation to some extent, we will try and concentrate on the last entry in Delacroix's journal and its significance today.

*Boulenc:* Of course Master, I agree with

BELOW: *Self-portrait of Delacroix, appearing in the 'Journal of Eugene Delacroix', published by Phaidon Press*







*'Landscape for Lovers' a semi-abstract painting by Boulenc, influenced by a Chopin Nocturne and the Thames at Shillingford Bridge. Here the colours of the landscape filter through those of the figures, symbolizing the integration of both into one feeling of ecstasy*

your contention that the first essential quality of a picture is that it should be a delight for the eyes, but I think that in view of the very different pictures shown in our galleries today, your remarks need qualifying. For instance you saw the recent exhibition of Contemporary American Painters at the Tate Gallery?

*Delacroix.* Indeed yes, it was my misfortune, I suppose they were called pictures because they were of a rectangular shape and hung upon the walls; but for me they were absurdities.

*Boulenc.* I agree that if compared with pictures exhibited in 1860, these areas of paint splashed or daubed on canvas or board must seem ridiculous; yet for some people these things of facile abstraction are a sheer delight, real or feigned. What, therefore, is a picture?

#### *Boulenc's Studio*

*Delacroix.* I think one difficulty is that of language, the time has come when we wish in one word to differentiate between the abstract decoration of slight aesthetic value and the picture where the image and subsequently the message can be understood, whether it is sympathized with or not.

Many abstract decorations are not pictures in the accepted sense, but daubs aiming at obtaining chance effects; this is an entirely different mental and physical attitude to painting as I conceived it a hundred years ago.

It is obvious to me that many of these so called Abstract Painters, literally throwing paint at the canvas, sometimes walking about on the paint to spread it, are merely paranoiac exhibitionists, who, if they have





anything more to communicate other than the chaotic state of their minds, certainly do not demonstrate it.

Naturally, they find applause from the pseudo-intellectual snobs with their vague pontifical phrases.

*Boulenc.* I agree that the observer needs to allot the necessary amount of importance to every art form, and to distinguish between facile decor and the much deeper aesthetic picture, where emotion, skill and communication are combined.

At the same time, I think it important to realize that with man's advance into the air, and whilst he is as at present probing further into space, it is natural that the artist's instinct is to project the new and unfamiliar in his imaginative work; for art acts as a spur to science, and vice versa. I have little doubt that Leonardo, if alive today, would have led a team of scientists at some aeronautical establishment; in spite of his scientific attitude Leonardo advised, in so many words the exploitation of the accidental image, seen for instance in the weather markings on an old wall; surely this was in a sense an excursion into the abstract?

*Delacroix.* Leonardo was a veritable prophet and a giant among artists; any image suggested by nature could become art, once his pencil touched the paper. His power of invention is still unrivalled by any artist. In the age of projected space travel, what an invaluable worker he would have been. But it is difficult for me to imagine how he would have reacted to the psychological problems of this age.

*Boulenc.* You stated in your journal that the art of painting, like music is higher than thought; hence it has advantage over literature, through its vagueness. Did you mean that the artist can concentrate attention in certain passages, leaving other areas vague so that when the picture is seen, the observer is encouraged to fill in those vaguely suggested areas with his imagination?

*Delacroix.* Yes of course, it is necessary that those who look at pictures are sympathetic and do not see everything literally.

*Boulenc.* Then you imply, surely, that painting is a language of conventional signs, which the public become accustomed to translate, the ancient Egyptian painting

being a case in point, where wall and papyrus paintings show figures in profile, stylized, and where the eye is painted as it would be viewed full face?

*Delacroix.* Undoubtedly this is so, how else can one describe three dimensional things with emotional content, on a two dimensional surface? I foresee that you are trying to entangle me and you will now ask me to give judgement on the conventional signs adopted by Picasso?

*Boulenc.* That is precisely my intention; I think that we agree that a painting must produce, after a short scrutiny, a reasonably correct approximation of that which the artist wishes to communicate and the impression left with the sympathetic observer: would you therefore condemn the use of

distortion in the image?

*Delacroix.* Oh no, within intelligible limits, distortion has always been a useful device giving a painter extra power of emphasis; for example, the elongated heads and hands of El Greco's figures, a technique still employed by the most spontaneous and powerful portraits of Augustus John today. But there is a golden mean in most things: distortion can be carried to absurd lengths: for that reason some of Picasso's work will be collected as curios not as art.

History will proclaim, perhaps, that this artist once said a great deal, but he found that it paid him a great deal more, to say a great deal less. Success can be financial without being veritable.

Picasso's preoccupation with destruction



ABOVE RIGHT: *Painting influenced by the theme from Symphony No. 6 by Beethoven. (1st Movement). 'Arrival in the country'. Painting by Boulenc.*

RIGHT: *This painting is also influenced by the same theme from Symphony No. 6 by Beethoven (1st Movement). 'Arrival in the country'. The painter, Boulenc, decided to recompose his previous painting and incorporate a more romantic element, which he felt was lacking in his previous painting.*



and distortion has produced in contemporary artists a cynicism, derogatory to great art, encouraging a break with all unifying craftsmanship. Remember, dear boy, anyone can break a 'Stradivarius'; in artists we look for construction not destruction.

It may well be that Picasso, in company with many other painters, saw or subconsciously felt that the camera was a rival to his art.

But I think that Picasso found that it pays well for 'a man to bite the dog'.

*Boulenc.* Do you find anything which is commendable in so called 'Abstract' art?

*Delacroix.* Certainly, I do, for you see, that since my day, the artist is aware of so many new influences, every development of science must affect him and I do not doubt that with their usual prophetic instinct, the artists are feeling their way ahead in the unresolved manifestations of their abstract paintings.

Yet I would advise the would-be collector to look always for the vein of sense in any picture they buy, and somewhere there should be a link with tradition and a respect for the materials that are employed.

*Boulenc.* Today it is possible to speak with anyone or to see anything in forty-eight hours, it is little wonder that art has expanded beyond the subjects acceptable a hundred years ago. The artist is bombarded with ideas in every waking hour. He is therefore more versatile. What therefore should the collector look for in art today?

*Delacroix.* I think you should advise a would-be collector to apply some standard common in all great artists work and that is their ability to draw poetically and well. Nothing but false effects can lie behind the work of those who cannot draw.

So much of an artist's work which is fresh in inspiration is shown by his sketches, and from them the collector can become so much more familiar with the ideals the artist puts before himself.

*Boulenc.* Certainly, if you cannot draw what your eye can see, how is it possible to represent images in the mind's eye?

*Delacroix.* Finally I think you must advise the would-be collector to look for some amalgam of truth and beauty mixed with inspiration and a simple directness of purpose in the composition; for the painter sets himself a problem with every work he undertakes; it is the success of his solution that we judge him by.

*Boulenc.* It is interesting to note how patronage of the arts has changed over the past century. The private patrons generally require smaller pictures for the wall space has diminished, and most artists are now drawn towards the patronage which commerce offers.

*Delacroix.* Generally, I think this is a good thing, for there are ten people today interested in painting, to the one who professed that interest in my day.

You were speaking of wall space; I am amazed that your larger firms in industry and commerce do not make better use of the wall space in their offices and factories and canteens. There is so much that pictures, placed correctly, can do for those whose lives require the remedial effect of a change of view which pictures can give them at the same time teaching them so much. Some people do not seem to realize fully the artist's importance in the pattern of life.

*Delacroix.* An artist is trained to see things with a deeper and more comprehensive perception; to see things and to interpret them.

Consider the Sunflower, how many people would recognize that flower's charms if it had not been for the emphasis given to this particular flower by Van

do you consider the most worth while to follow in this present age?

*Delacroix.* As I see it artists are grouped under two main categories. The best in each should be considered important.

First, there are those who work to consolidate improvements in techniques and exploit the best of the past masters work.

Secondly, there are those who are experimenting with new techniques, who take pains to establish their individuality so as to be unmistakably recognizable. The latter are encouraged in this attitude by the galleries, who know the public's weakness for wanting immediately to be able to recognize work by certain artists.

*Boulenc.* You speak of the latter class as if you disapproved of this so called 'hand-writing' of the artist.

*Delacroix.* Oh no, I only meant to imply



*Painting influenced by theme from Symphony No. 6 by Beethoven (3rd and 4th Movements), 'Peasants merrymaking and the storm' by Boulenc*

Gogh? If there had not been so many reproductions of these paintings, I have little doubt there would be far fewer people who would attach so much importance to this flower.

Think of sunsets; poets and painters and musicians all have contributed in intensifying the beauty of a sunset to its observer. At one time I can remember that one seldom mentioned a sunset without coupling it with Turner's name.

*Boulenc.* Which type of schools of painting

that there is a danger of over-self-conscious work, where the aim is to be different for the sake of being recognized, and not for the right reason; that of establishing a natural individual style where the hand is directed by the soul.

*Boulenc.* Thank you Monsieur Delacroix, you have given me a little encouragement in this age of conflicting ideas, it is a good thing to have a point of view, to act as a basis for further inquiry into the ever changing world of art.



# The struggle to save the irrigated lands on the Lower Indus Plain

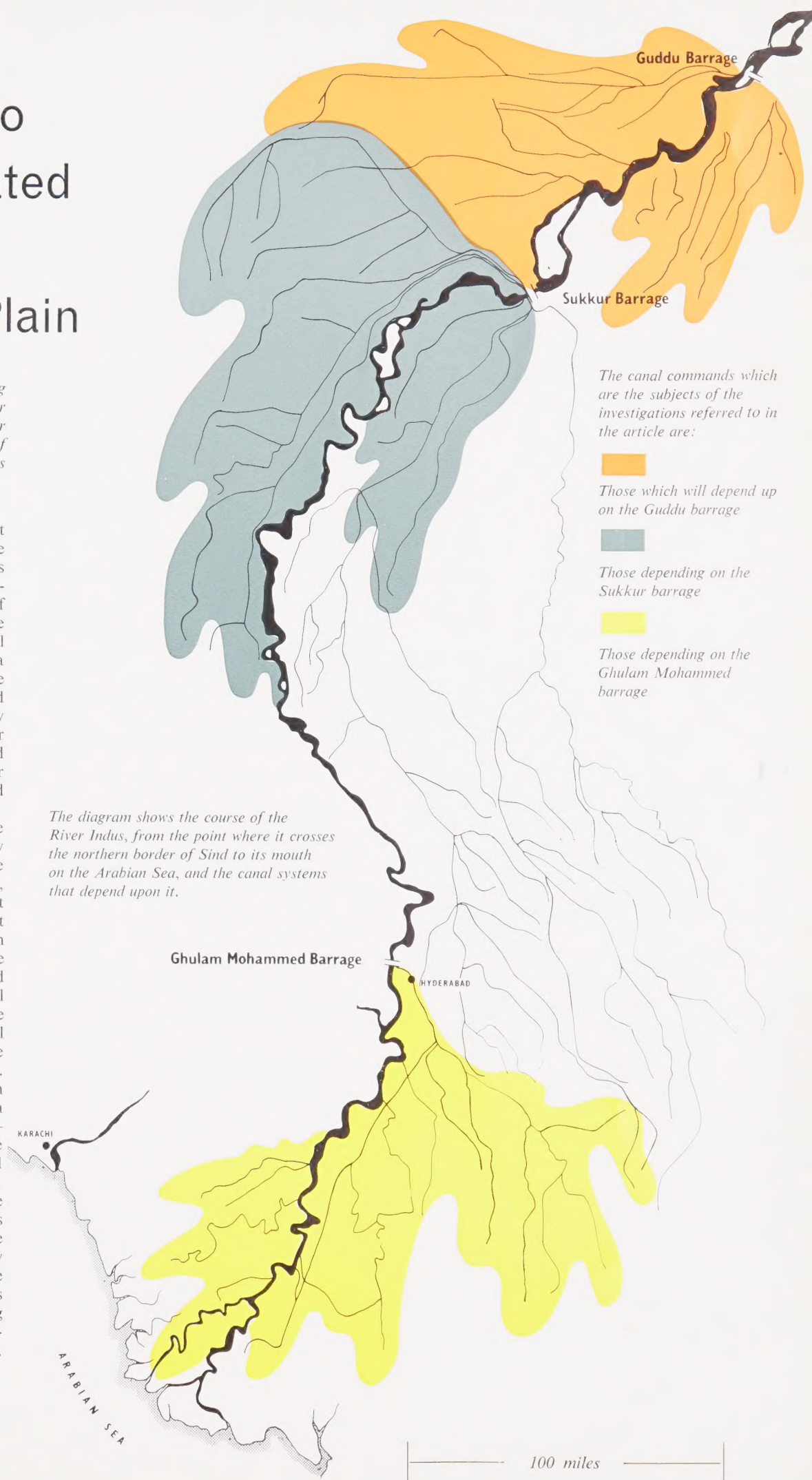
*Hunting Technical Services are investigating problems of waterlogging and salinization for the West Pakistan Water and Power Development Authority. The deterioration of good farming land along the middle reaches of the Indus is causing serious concern*

THROUGH THE WHOLE length of West Pakistan, from the Himalayas on the northern border to the Arabian Sea, flows the River Indus. In this land of scanty rainfall millions of people for thousands of years have depended on the waters of the great river for their crops, their thirsty soil made fertile by the seasonal floods. For a century or more the annual floods have been to some extent controlled and directed by inundation canals, while more recently barrages across the river linked to a further system of canals have led to year-round irrigation. Each step has converted a wider area of semi-desert into productive and prosperous farm land.

West Pakistan lies across one of the world's great desert belts; at approximately the same latitudes to the west are the deserts of North Africa, northern Arabia, and southern Persia, and just to the east is the Thar desert of India. For the great parts of its length the Indus flows through flat land where rainfall is low, skies are cloudless for very much of the year, and evaporation is very high. To a critical extent the present prosperity and future hope of the population and the national welfare of West Pakistan depends on the huge areas irrigated by the Indus waters.

But irrigated agriculture dependent on the river is being threatened by twin dangers – waterlogging and salinization – which constitute a threat not only to the people living on the land in the irrigated areas, but to the national economy and well-being as a whole. For these reasons the fight against waterlogging and salinity is now in the forefront of the activities of the Water and Power Development Authority (WAPDA) of West Pakistan, who have entrusted the investigation of the problems to Hunting Technical Services Ltd. working in association with Sir Murdoch Macdonald and Partners, consulting engineers.

*The diagram shows the course of the River Indus, from the point where it crosses the northern border of Sind to its mouth on the Arabian Sea, and the canal systems that depend upon it.*





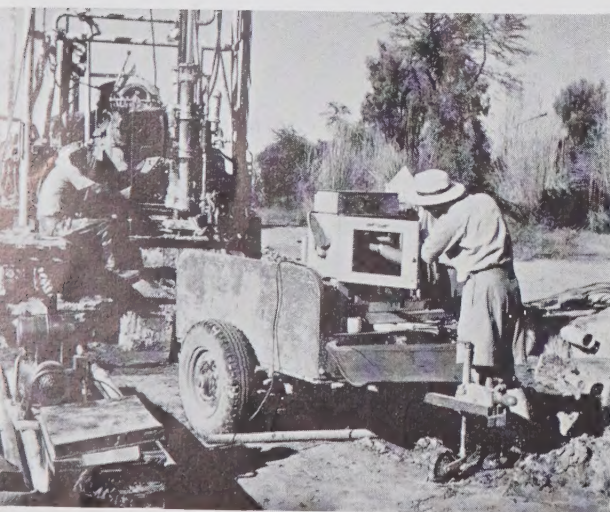


LEFT: A Huntings soil survey team beginning a permeability test on an auger hole in salty land. The bailer, being inserted in the cased bore, removes water from the hole, thus temporarily depressing the water table. Permeability is calculated after measuring rate of rise of water in the hole

The reality and magnitude of the dangers facing this irrigated land are forcibly brought home to a traveller in these parts. He will see stretches of land – good farm land not long ago – completely under water, inhabited only by huge flocks of duck. On a windy day he may encounter white clouds of biting salt, blown off sheets of abandoned land coated white with salt crystals and supporting only occasional tamarisk bushes or other halophytic plants. These are extreme cases; he will also see thriving farmers growing a wide variety of crops. But the bad areas are there as a warning, and in between the extremes are many instances where the farmer must struggle to keep his family going on land where encroaching water or salt makes his task ever harder.

The task for the investigators is to combat this gradual drowning and poisoning of the land. Firstly to find out why it is happening, then to halt the trend, and eventually to reverse it. Solutions will not be easy to determine and they will be costly to implement, but solutions must be found if this greatest of national assets – the good land – is not to waste away. The present investigations are designed to fill in the broad picture, to pose a lot of questions and supply answers to them, so that an overall solution or complex of solutions can be defined. At the same time more extensive studies are being carried forward, in one or more relatively small canal or branch canal commands, so that design of remedial measures can be finalized and works actually built. For although the attempt must be made to see the problems in their entirety, on a regional basis, it is essential to get some actual works into operation at the earliest opportunity. Not only is this technically important so that the effect of specific measures can be observed and measured; it is also important to inspire confidence and hope in the people whose lives are directly affected.

There are really two sides to such investigations; an examination of the extent of the dangers and their causes, and the formulation and design of remedial measures. Assuming that salt is not already present in the soil, build up of salinity can either occur through addition of salts in irrigation water, or through a rise into the upper soil of ground waters containing salts. Both factors may operate together; but a rise in a saline water table is probably the commonest and most serious cause of salinity, and the effect may be extremely rapid.



LEFT: A Boyles drill rig, operated by the Turiff Construction Corporation at a 600 ft. exploratory bore site; in the foreground a Huntings man operates electric logging equipment

These two British firms are already an experienced combination, having been at work together for some time in Iraq, where salinization of land watered by the Tigris has been a source of trouble for centuries.

The areas to be investigated in Pakistan lie almost entirely within the former province of Sind, and comprise the millions of acres watered by the canal systems fed by the Sukkur and Ghulam Mohammed barrages and by the new barrage now being thrown across the Indus at Guddu.



Waterlogging is generally the result of a rise in the groundwater; but more rarely such conditions may result from surface flooding of impermeable soils. So the causes of waterlogging and salinity must be identified, and their relative importance assessed. Contributory factors must also be investigated. For example, one must ask whether the rise in groundwater resulting in or threatening waterlogging is materially affected by seepage from canals; whether the application of irrigation water is excessive; whether systems of cropping in present use aggravate the conditions; and a lot of other questions.

When it comes to design of measures to put things right, other problems and alternatives appear and must be answered. The basic measure is obviously drainage, but the area is extremely flat; what are the internal drainage characteristics of the soil, and how do they affect drain spacing? Is the subsoil suitable for construction of open drains or for their maintenance? How are weed control problems to be solved in open drains carrying clear water over discontinuous periods? Drainage may be based on tube-wells, so an investigation to determine their feasibility must be made. At what depths do water-tables occur? Are they continuous or perched? Are the

groundwaters saline or fresh? If the former, how saline are they? – because the economics of a tube-well system must be related to the re-use or disposal of the water pumped out. If it is too saline for addition to the canal system, a separate system of disposal canals would be needed: the cost in this case would almost certainly rule out tube-wells as a drainage solution. The effectiveness of tube-wells in lowering the surrounding water table must also be tested. Combinations of the two systems may be needed, and the use of pumps on shallow wells must not be neglected.

To carry out these investigations a varied team of British and Pakistani experts is at work. Soil men take samples throughout the area and carry out permeability tests to determine the drainage characteristics of the soil. The soil data will result in maps showing distribution of different soil groups; extent and degree of water logging and salinity; texture of subsoil at drain depth, and other information used in design work by both engineers and agronomists. Engineers and surveyors study drain alignments, outfalls, canal seepage, flood control and other problems in the field; and carry forward designs and layouts in the office through to the stage when actual contracts for construction can be let. Another British

firm, the Turiff Construction Corporation Ltd. is carrying out a programme of exploratory bores and tube-well drilling, with a Huntings team engaged in salinity tests by electrical logging and water sampling of these bores, and making yield tests from tube-wells. Agriculturalists and agricultural economists study crop systems and farm economics; changes in cropping methods may be necessary and it is vital to see that these are not only technically feasible but socially and economically viable.

It all adds up to a very comprehensive operation, and it has to be carried through as rapidly as possible. The problems are vast and urgent, and solutions must be found so that the trend of deterioration can be halted and improvements begun. All available knowledge and information has to be used, from accumulated river and canal gauge readings, well water levels, revenue and agricultural production records, to the aerial photography, land-use and geological maps and reports resulting from the Canadian Colombo Plan Survey – which is here proving its value as a source of basic information in a readily accessible form. This is a struggle of which the outcome has got to be success, because on it hangs the future of a country.

*Irrigated farm land which has become waterlogged and turned into swamp*







*The Dadu canal, one of the main canals off-taking from the Sukkur barrage, wanders through the shadows cast by overhanging Shisham trees on its way to irrigate the flat lands of Sind*

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